

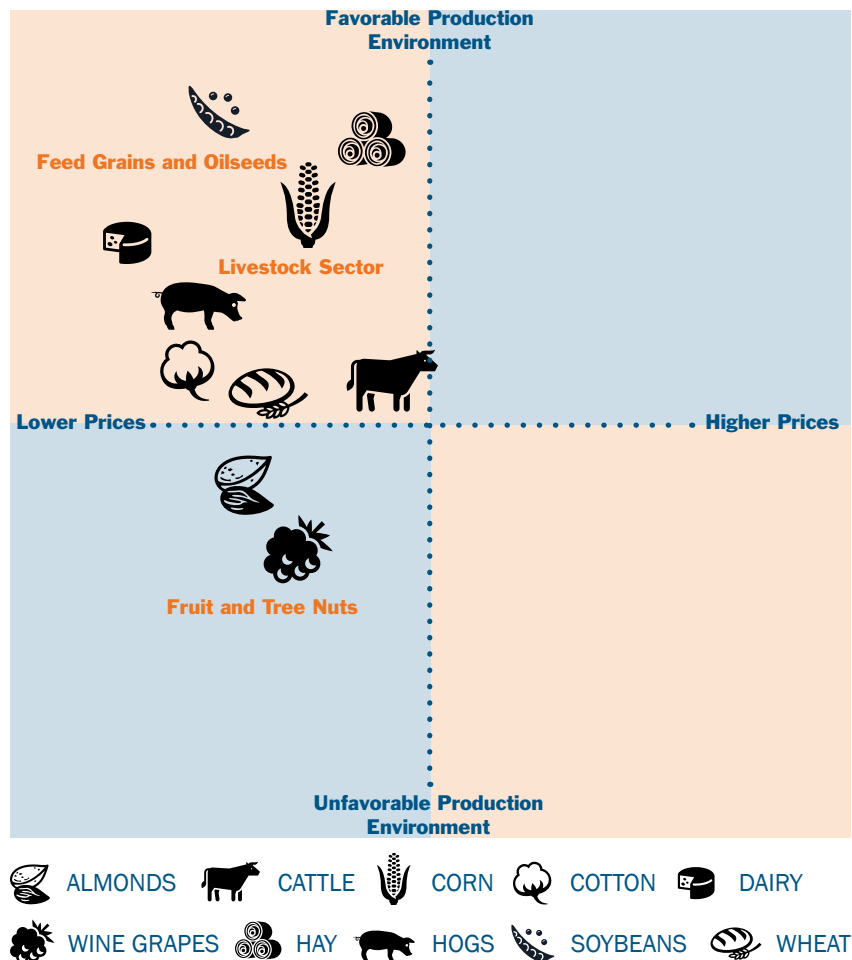
The Feed

Farmer Mac's Quarterly Perspective on Agriculture

Spring 2016

FARMER  AC
FINANCING RURAL AMERICA

Production and Market Price Perceptual Map



Key Highlights

Farm income in 2016 is expected to be down across most farm business types.

Farm debt is increasing but now at a decreasing rate; estimated annual farm debt payments are still low compared to the 1980s.

Agricultural exports face major headwinds, but there are reasons to remain optimistic.

For the third consecutive year, net farm income is projected to fall in 2016 as a result of lower commodity prices and ample global supplies. Very few sectors touted higher prices at the end of 2015 compared to the beginning, and the price forecasts for 2016 are lower for most major ag commodities. However, government payments through the Agricultural Risk Coverage (ARC) and Price Loss Coverage (PLC) programs should help offset the lower profitability for crop producers. Farm assets were down in 2015 and are projected down again for 2016 due to the liquidation of financial assets to meet cash flow needs, lower inventory values carried at lower market prices, and small declines in real estate values. Real estate and non-real estate debt look to be on the rise in 2016 but at a slower pace than during the transition years of 2014 and 2015. Weather conditions in the West are improved because of El Niño precipitation, particularly in the Pacific Northwest. Though considerably more precipitation may be required to fully alleviate the effects of the drought, a wet 2016 water year is a good start. The U.S. Department of Agriculture (USDA) projects an overall decrease in acres planted to crops in 2016, largely driven by lower wheat acreage. Acres planted to corn are expected to increase in 2016. Crop prices have declined in recent months due to the large carry-in crop from the 2015 harvest. Stiff competition persists for U.S. dairy producers in foreign markets, and lower market prices are likely to remain throughout the year. Cattle herds continue to rebuild in 2016, putting downward pressure on cattle prices. Reduced profitability for feedlots will likely continue to depress cattle prices throughout 2016. Broiler prices were down in 2015 on higher cold storage inventories, but demand is inching up on the pricing differential between poultry and beef, while it is hopeful that avian influenza concerns ease in overseas markets. Wine grape producers received lower prices in 2015, which was the result of a good harvest, increased interest in mid-to-higher priced wines, and increased competition from the craft beer industry. Hops prices have soared in response to a tough harvest and the rapid growth of craft brewing.

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The initial USDA projections for the 2016 farm economy could be an inflection point. Net farm income, an accrual-based economic measure of sector income, is projected to fall by only three percent to \$55 billion. This is a small drop compared to the declines in 2014 and 2015 of 27 and 38 percent, respectively. Net cash income, the amount of income left to producers after they have paid for all cash expenses, is also expected to decline in 2016 but by only two percent to \$91 billion. Net cash income is a sounder measure of sector financial health for lenders as it gives a better picture of cash available for living expenses and debt servicing. Commodity prices have stabilized somewhat in early 2016, unfortunately at lower levels, which appears to be driving the leveling-off of farm income. This year will represent the third consecutive year of lower crop prices and the second year of lower livestock and protein prices. Producers in all major classes of sector production

show stable-to-lower than expected incomes during the year with dairy producers showing the largest drop due to declines in milk prices. While a third successive decline in farm incomes is historically rare, producers are adapting to the lower market price environment from a position of relative financial strength.

Farm assets are also expected to compress in 2016 while debt levels are set to expand. Farm assets are expected to decline by just under two percent this year to \$2.7 trillion, driven by lower real estate values, lower crop and livestock inventory values, and lower levels of financial assets. The combined effects of the asset value declines indicate a realized or unrealized loss of nearly \$130 billion since 2014. Simultaneously, farmers and ranchers are expected to take on additional debt loads to offset the lower level of incomes. While the total debt load projected for 2016 will hit a nominal high at \$372 billion, when adjusted for inflation, the level of combined farm debt does not exceed the historic highs reached in the

1980s. Not only is the projected level of farm debt below peak, the annual cash required to service that debt is well below the levels witnessed during the farm crisis years. By reversing the USDA's debt servicing ratio and adjusting for inflation, Figure 2 demonstrates the buildup of debt service requirements in the 1980s driven largely by higher interest rates. Debt payments today have roughly the same principal component but a significantly lower portion attributable to the interest payment. Given today's accommodative interest rate environment, the cash flow required to service debts remains well below the sector net cash income. In 1981, however, the sector debt payments exceeded net cash income, causing significant sector-wide financial stress. Today, expected net cash income is 1.8 times the estimated sector debt payments, just below the historical average of 2.1 times. Clearly, a dovish interest rate environment is beneficial to farmers, ranchers, and agricultural lenders.

Figure 1: Farm Business Net Cash Income Trends by Year and Production Type

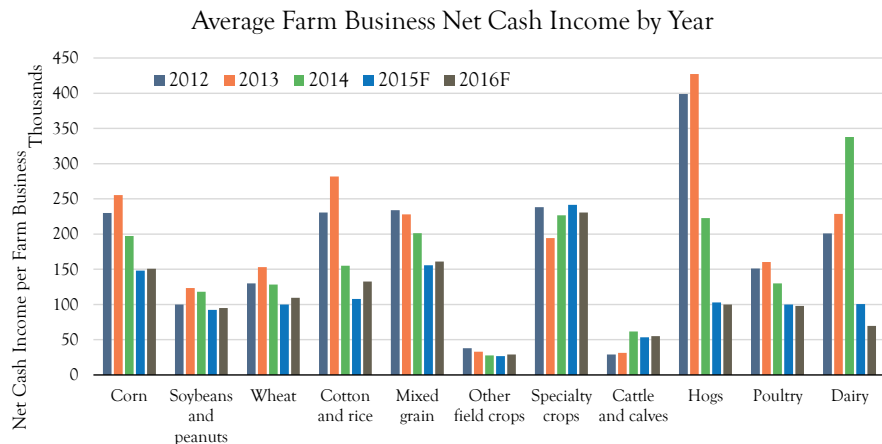
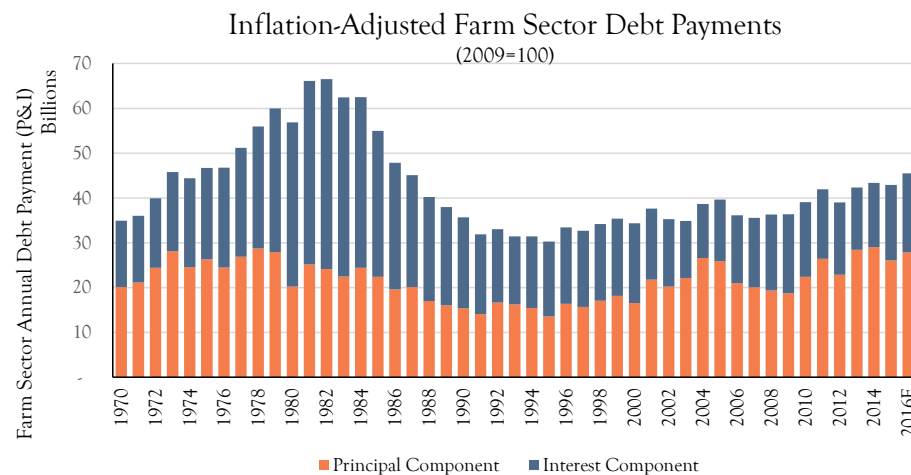


Figure 2: Real Farm Debt Payments



Key Highlights

USDA economists expect farm income to decline for the third consecutive year in 2016.

Farm equity is expected fall again in 2016, but farm assets are holding up fairly well.

Although debt levels continue to increase, estimated inflation-adjusted annual debt payments are still significantly lower than the 1980s.

SPECIAL REPORT: AGRICULTURAL EXPORTS AND THE U.S. DOLLAR

(resource 3, 4, 5)

Key Highlights

Agricultural trade represents approximately one-third of the value of U.S. agricultural production.

The recent strength of the U.S. dollar has proved to be a headwind for agricultural exports.

Certain states (California, Illinois, and North Dakota, among others) are more sensitive to changes in foreign demand due to a higher percentage of annual agricultural cash receipts exported.

Bulk commodities (e.g., soybeans, corn, wheat, etc.) represent a high percentage of the total value of U.S. agricultural exports.

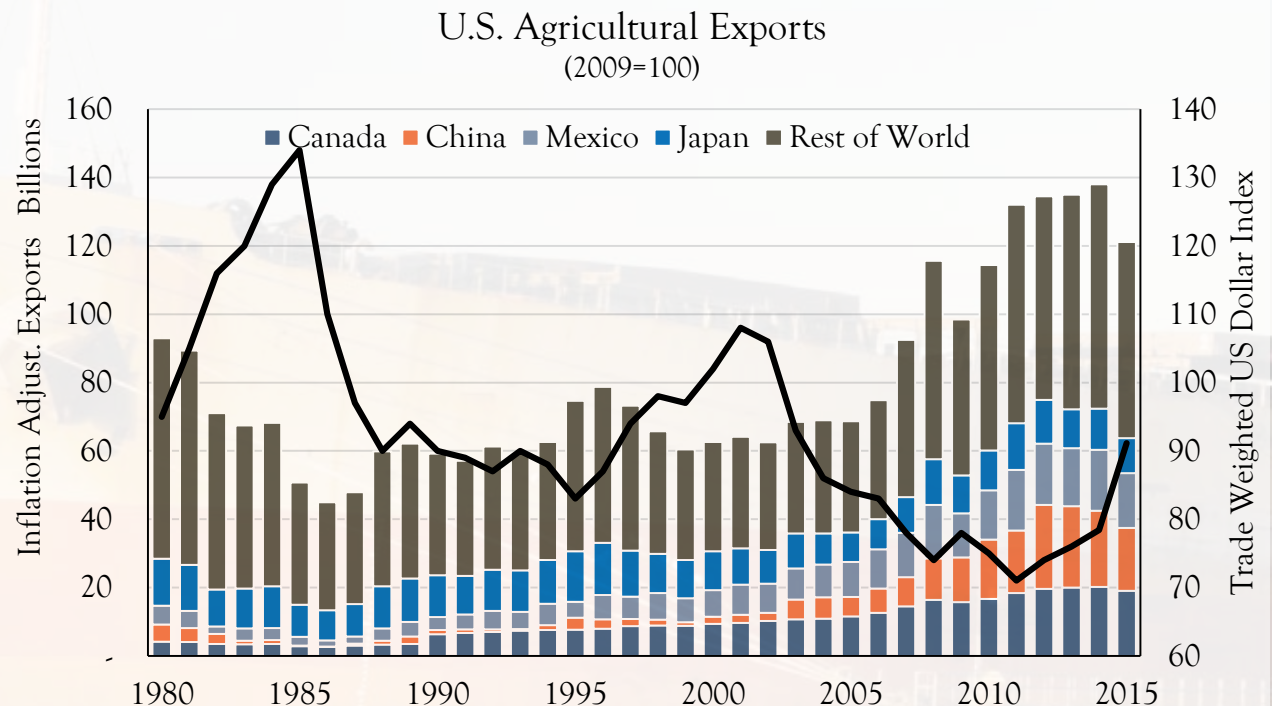
Expanded trade opportunities remain a bright spot in the future of the U.S. agriculture sector.

Trade is now a major source of demand for the U.S. agriculture sector. In 2015, the USDA Foreign Agricultural Service estimates that U.S. ag exports fetched \$133 billion in receipts, which is roughly 31 percent of the total value of U.S. agricultural production during the calendar year. In 1970, the ratio of agricultural exports to production was only 13 percent. Some of the growth has come from expanded trade with long-term trading partners like Mexico, Canada, and Japan; approximately 40 percent of the value of exports is with these three countries, up from 25 percent in 1980. Other growth has come from new and expanded markets such as China, where sales of agricultural products represent over 15 percent of total U.S. exports, up from just five percent in 1980.

However, there are several conditions that threaten U.S. agricultural export markets. First, currency effects from

a stronger dollar in 2015 have made U.S. agricultural products more expensive relative to competitors in Brazil, Australia, and the European Union (EU). Figure 3 shows the history of U.S. agricultural trade adjusted for inflation overlaid with an index of U.S. dollar strength. During all three spikes in U.S. dollar strength, agricultural export values declined, particularly in the early 1980s and the 1990s. In fact, the correlation coefficient between the two metrics is -0.71 implying a very strong, inverse relationship between the two. In 2015, U.S. ag exports slumped by more than 11 percent while the U.S. dollar strengthened by 16 percent. The U.S. dollar has weakened somewhat in early 2016, but it remains highly elevated compared to 2014. Second, global supplies of agricultural products have rebounded significantly from the lows experienced in 2012 and 2013. The extraordinary run of commodity prices from 2008 through 2013 triggered a worldwide expansion

Figure 3: U.S. Agricultural Exports and the U.S. Dollar



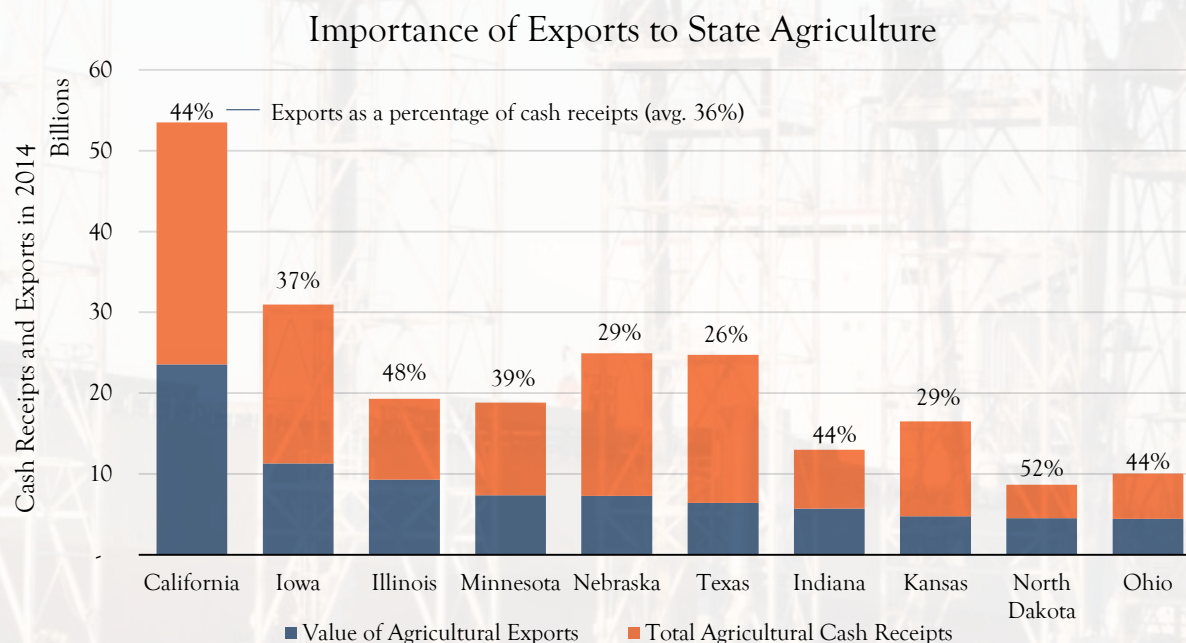
in the production of bulk commodities – between 2007 and 2015, world production of corn, soybeans, and wheat increased by 22, 46, and 20 percent, respectively. The rise in global production has increased the competition faced by U.S. producers tremendously, particularly from South American producers in Brazil and Argentina. Finally, global politics have seeped into the farm gate. In 2014, Russia banned imports of Western products in retaliation for sanctions related to its annexation of Crimea and intervention in Eastern Ukraine. Domestically, trade has become a hot-button issue in the 2016 presidential race, with virtually all candidates in both parties stepping back from international trade deals like the Trans-Pacific Partnership (TPP). All of these circumstances create considerable headwinds for the expansion of U.S. agricultural exports.

Pressure on U.S. agricultural exports will not affect all producers equally. Some states export a higher percentage

of their agricultural production than others. Figure 4 depicts the top ten agricultural exporting states and how much of their 2014 cash receipts were represented by export values. California had the highest absolute level of agricultural exports in 2014, but North Dakota exported the highest proportion of its total agricultural cash receipts at 52 percent. The higher the proportion of exports to sales, the greater the exposure to foreign markets and a downturn in agricultural trade. States like California, Illinois, and North Dakota have higher export to sales ratios owing to the types of goods produced within their borders. For example, California is a major producer of almonds and about 75 percent of each almond crop is exported to global markets. Field crops such as soybeans and corn represent roughly one-third of U.S. ag exports. Soybeans alone represent 16 percent of 2014 U.S. ag export values. Producers of these commodities will likely be adversely affected by a slowdown in global trade in 2016.

Despite these headwinds, there are still many good signs for U.S. agricultural exports. Over 95 percent of the world's population in 2015 lived outside the United States, and that number will likely increase in the future as emerging markets in Africa and Asia continue to develop. The most recent United Nations estimates put world population at nine billion by 2040, a full decade earlier than many thought just five years ago. The global population growth presents an incredible opportunity for U.S. farmers and ranchers to increase reach and market size. The TPP may have lost some steam during the U.S. presidential primary season, but there is still good support for the trade deal in many corners of Congress. Trade agreements like the TPP and the Transatlantic Trade and Investment Partnership (TTIP) will open the doors to these growing markets, giving a growing number of consumers access to the richest, safest, and healthiest food the planet has to offer.

Figure 4: U.S. Agricultural Exports by State of Production



The much-hyped El Niño of 2015-2016 began the year largely living up to expectations as widespread rain and snow improved the drought situation throughout much of the West. However, a mild and dry February halted some of the progress as California Sierra Nevada snow water equivalents (SWE) diminished from above normal at the beginning of the month to below normal by the end of the month. March trended back toward a stormier pattern, which helped bring SWE closer to historical averages. Heading into spring, attention in California will turn toward reservoir fill rates as the winter snow melts, along with state and federal water allocations for 2016, which are both expected to remain modest. Much of the Pacific

Northwest has experienced a significant improvement in drought conditions through the winter.

Soil moistures throughout the United States are generally at or above normal for this time of year, particularly throughout the Midwest. This augurs well for spring planting, provided that moisture levels do not increase significantly and impede field work.

As the 2015-2016 El Niño begins to diminish throughout the spring and early summer, the amount and timing of precipitation in the Midwest should be monitored. As El Niño events fade, there is often a trend for warm and dry weather in the Midwest from late spring into summer. Current seasonal forecasts reflect this pattern. This is not to say that a widespread drought is expected; however, poorly-timed dry weather can certainly affect seed germination and crop growth.

Key Highlights

El Niño brought improvement to drought conditions across the West until a mild and dry February, though March was certainly moister.

California snowpack is improving but appears to be close to normal, rather than a “blockbuster” El Niño snow year.

Soil moisture conditions in the U.S., particularly in the Midwest, are good heading into spring.

As El Niño conditions begin to wane, warm and dry conditions can form in the Midwest from late spring into mid-summer. Current seasonal forecasts are consistent with this tendency.

Figure 5: Drought Monitor Map
(USDA, NOAA, University of Nebraska-Lincoln)

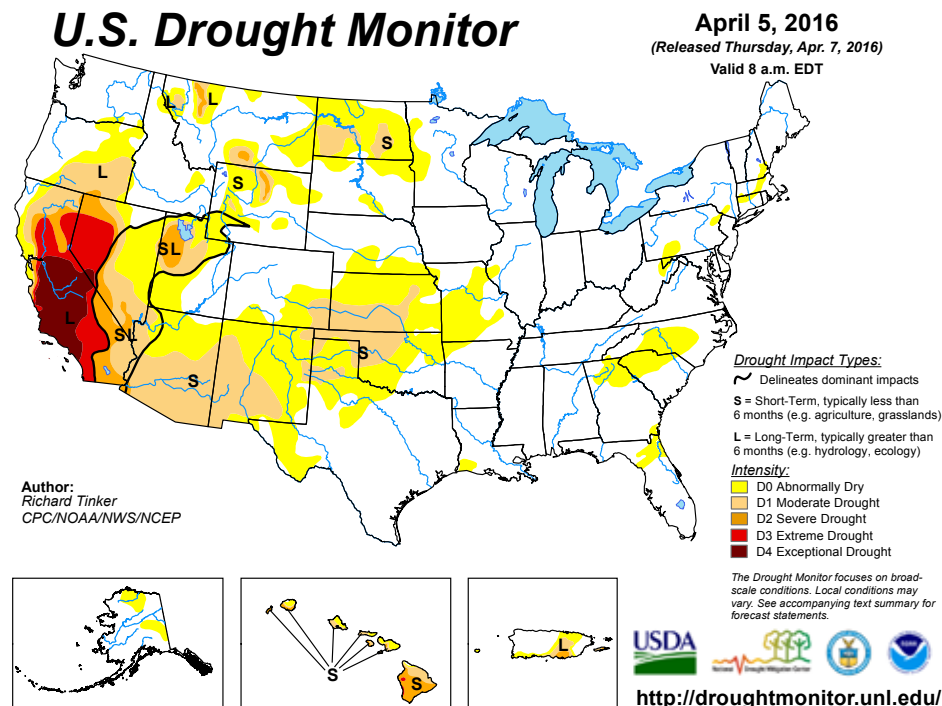
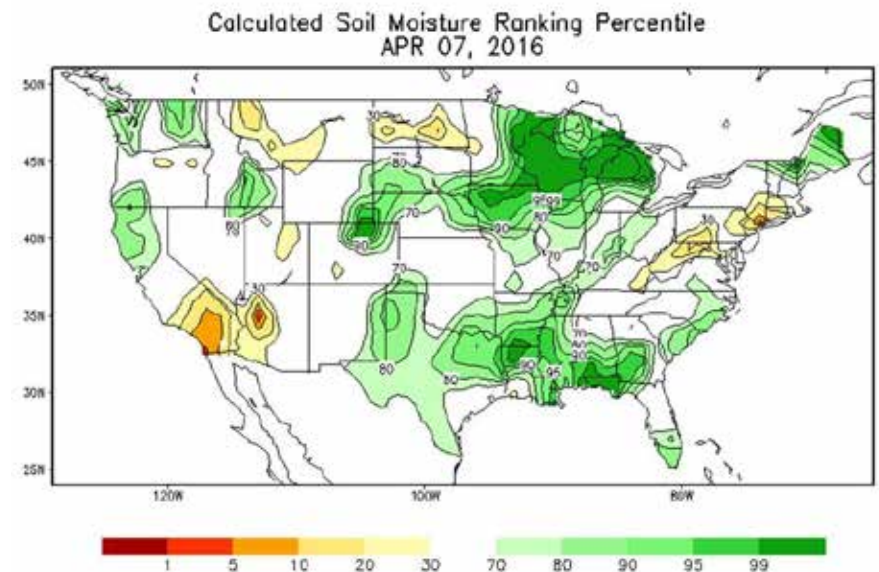


Figure 6: U.S. Soil Moisture Ranking



For corn and soybean growers, 2016 looks to rhyme fairly well with 2015. Global supplies of both commodities head into the planting season at multi-year highs. World production of corn and soybeans increased 2 and 13 percent, respectively, in 2015, and expectations for 2016 demonstrate similar levels of production due to record crops in China, Argentina, and Brazil. In the U.S., early USDA surveys show more acres planted with corn and soybeans in 2016 compared to 2015, with many acres coming out of wheat. The higher acres planted may or may not increase production, however, as the probability of a dry growing season is higher after a strong El Niño weather pattern. Soil moisture is very good heading into the plant, so more time will be needed to better estimate

the size of the U.S. crop in 2016. But supplies are ample heading into planting season.

Demand for corn and soybeans is expected to increase in 2016. Grain consuming animal units are up in the early part of the year, and the lower feed prices should motivate protein producers to increase the number of animals on feed and their time on feed. Ethanol and biodiesel production remains steady despite lower oil and gas prices, and lower prices at the pumps may lead to an increase in national gasoline consumption this travel season. Export market growth will likely be limited by intense competition from South American growers in 2016. Brazil is expected to have a very large safrinha, or second corn crop, which harvests at virtually the same time as the U.S. crop (see Figure 8). Argentina is quickly developing as a major competitor for U.S. corn producers after its recent

presidential election. Specifically, the new administration is very pro-agriculture, and in December of 2015, just five days after the presidential inauguration, it reduced export tariffs and instituted currency controls that will prompt producers to expand production and exports of corn. And while Argentina's harvest timing does not directly compete with the U.S., a larger supply of spring corn will hurt growers with crop in the bins after harvest.

The net of the supply-demand forces for grains indicate lower prices in 2016. The USDA projects a season-average corn price of \$3.45 per bushel (a \$0.15 drop from 2015) and a soybean price of \$8.50 per bushel (a \$0.30 drop from 2015). Barring a major supply-side or U.S. dollar disruption, these lower prices are likely to persist into 2017.

Figure 7: Historical Crop Plantings and Expectations for 2016

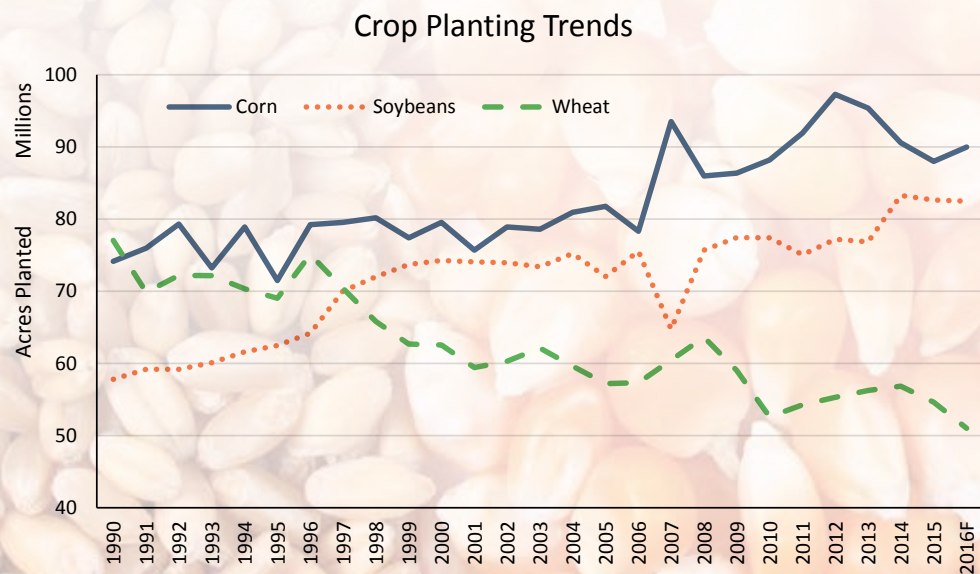
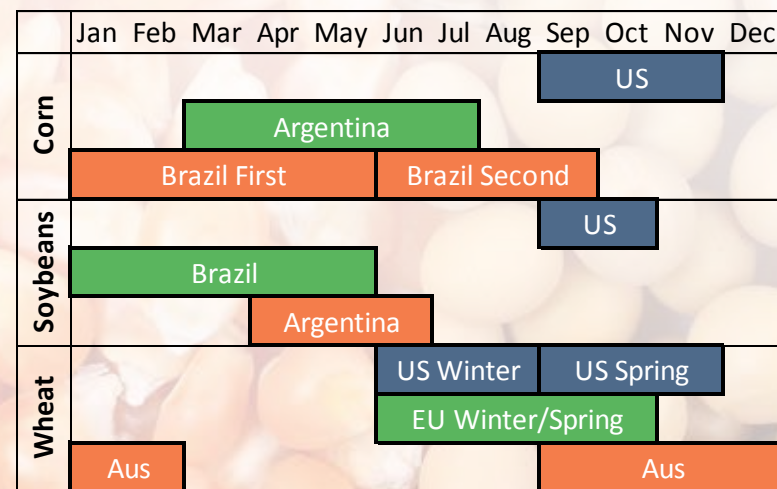


Figure 8: Global Crop Harvest Timing Grid



Key Highlights

Low world dairy prices persist in response to more than adequate supplies.

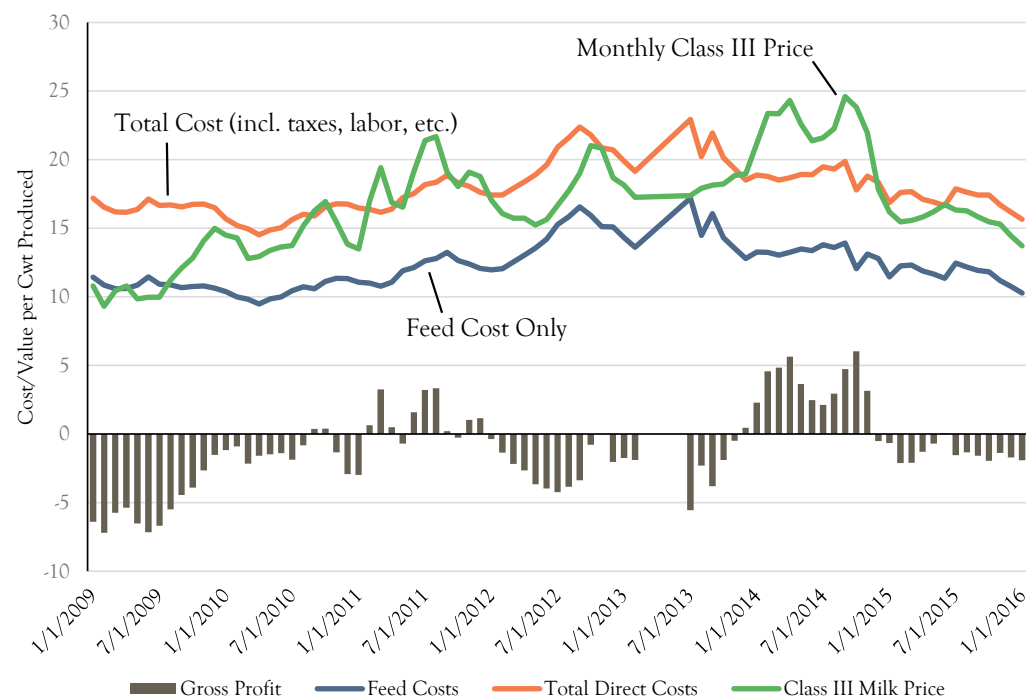
Milk production rose in 2015 for major exports in the U.S., the EU, and Oceania.

Producer profitability will be tight in 2016 with continued low milk prices but stable production costs.

Supply-side economics in the dairy industry continue to drag sector profitability. USDA data shows U.S. production in the winter months from December to February is up by almost two percent on a higher number of cows combined with a higher average output per cow. The ratio of ending stocks-to-use, a relative measure of dairy supplies in inventory at the end of each calendar year, reached its highest levels in 2015 since 2009 for many dairy products. Milk production at California dairies continues to struggle in early 2016 due to lower output per cow. The stress on herds from the extended drought conditions is likely the major contributor to the decline, but water conditions have improved in many parts of the state. Global supplies remain in surplus after strong production in 2015 and slower global trade in early 2016.

Figure 9: Historical Dairy Profitability

US Average Dairy Returns



Source: USDA ERS National Milk Cost of Production Estimates

Product demand remains muted in the early months of 2016. Domestic dairy product use has held steady during the winter months, but exports are down dramatically through January. Russia continues its ban on Western agricultural imports through August 2016, and their disappearance from the import picture has put more European dairy products onto the world market. Chinese dairy imports picked up in late 2015 and early 2016, and that has provided some support to world dairy prices. U.S. producers are at an added disadvantage to both the EU and Oceania due to the currency effects of a stronger dollar.

The combined effects of the supply and demand functions imply continued pressure on producer profitability in 2016. The Federal Order Class III milk price for March

was \$13.78 per cwt, up slightly from February but well below prices in 2014 and 2015. The USDA is forecasting an average Class III milk price near \$13.90 per cwt for 2016. Feeding costs could abate somewhat in 2016 if grain and hay prices stay low. Supplies are not likely to contract by much, so producers must look to control costs and spur demand growth at home and in new overseas markets. Implied profit margins based on estimated costs of production and a Class III milk price have been negative for 14 consecutive months, but the implied margins are not nearly as severe as they were in 2009 when the dairy industry last faced a major cyclical downturn. This year is unlikely to turn into another 2009, as restaurant sales remain strong, domestic cheese consumption is holding up, and global trade is merely subdued, not closed.

While the 2015 almond crop failed to break any records, producers maintained production levels attained in 2014. California, the state that produces nearly 100 percent of all U.S. almonds and over half of the world's annual supply, spent the entirety of the growing year in a deep drought with restricted access to state and federal water allocations. Yields were down again in 2015, likely a factor of the deepening drought and early bloom. Lower yields were offset by the greater bearing acreage under production, a trend that has been increasing in recent years due to more acres planted to orchards. Non-bearing almond acreage stood at 150,000 acres in 2014, a 20-year high. As orchards mature, more of the almond acreage begins to bear nuts, and the total potential production increases. Global supplies were up in 2015 on higher production in Australia and the EU, but U.S. producers dominated world trade, as U.S. almonds represented over 85 percent of almond shipments in 2015.

Demand for U.S. almonds weakened during the last year. A robust export market in 2014 drove up prices more than 15 percent during the year, but both domestic and foreign consumers pulled back in 2015. U.S. almond exports fell five percent during the 2014/15 marketing year on ample global supply and a stronger U.S. dollar, and domestic consumption fell by ten percent. Shipments have picked up in early 2016, but the drop in demand during 2015 left higher carry-in and boosted inventories on the almond balance sheet.

In response to these market conditions, almond prices have dropped considerably since early 2015. The combination of steady supplies and lower demand pushed

up uncommitted inventories in early 2016 to new heights. The Almond Board of California reports inventory levels monthly, and while in most years committed shipments of almonds pushed the inventory levels into a negative position during the late summer months, the last two years have seen positive inventories during that same period (see Figure 10). However, lower prices and a drop in the U.S. dollar are spurring sales, so market prices may find some support by mid-year. Reports published by Derco Foods, an almond trading company, show its market prices dropping nearly 60 percent in mid-to-late 2015 from over \$5.00 per pound to nearly \$2.00 per pound. While the average price to growers is likely closer to \$3.00 per pound, this intense price volatility will negatively affect prices paid to almond growers in 2016 and 2017.

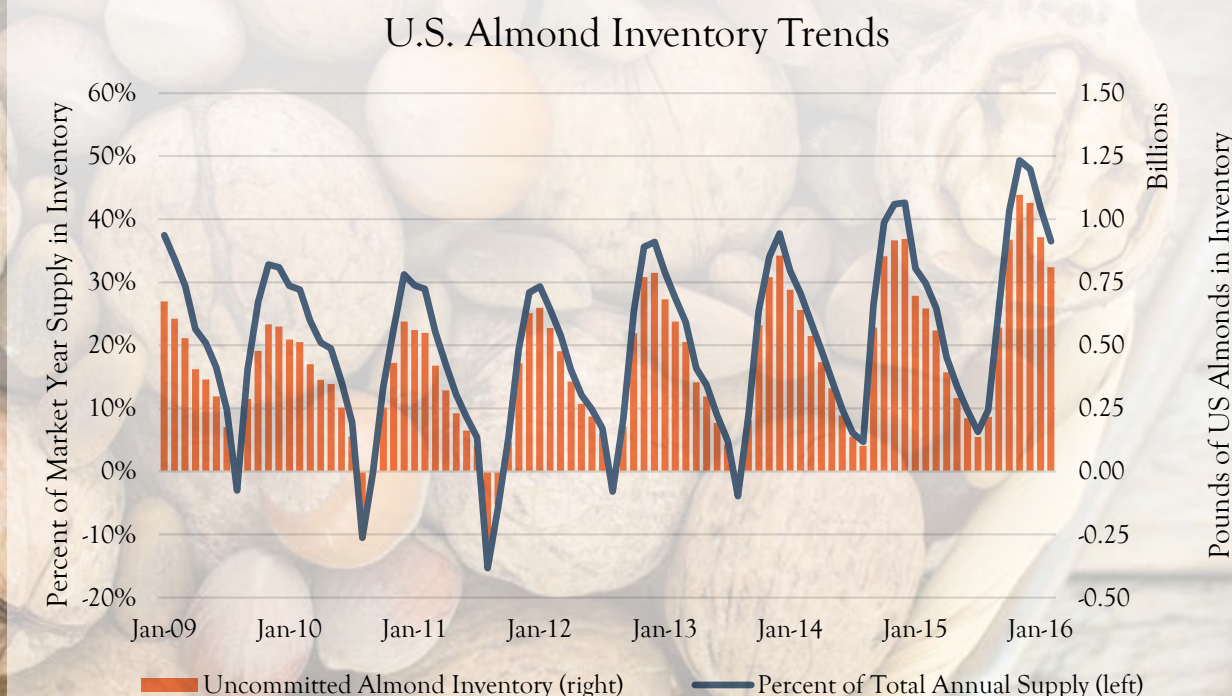
Key Highlights

The 2015 California almond crop weighed in at approximately 1.8 billion pounds, roughly equal to the 2014 crop.

Grower almond prices peaked in early 2015 and have continued to decline into early 2016 on weaker export demand.

Inventories sit at near-term highs putting downward pressure on prices.

Figure 10: U.S. Almond Inventories



Key Highlights

Beef market conditions signal herd expansion and lower cow/calf prices in the near future.

Pork production is up in 2016 but the higher supplies and weaker export markets have put downward pressure on hog price expectations.

Broiler sales continue to struggle overseas and prices are down as a result of large inventories.

BEEF

Beef production in the U.S. is set to rebound in 2016 after a five-year slide (Figure 11). Cattle inventories are on the rise and the good pasture conditions and cheaper feed prices during 2015 have spurred cow/calf operators and feedlots to increase animal weights prior to slaughter. Cattle producers are retaining more heifers in 2016, and the higher retention signals further expansion into 2017. Demand for beef buckled somewhat during 2015 as consumers faced record-high retail prices and exporters dealt with a stronger dollar. Since March of 2015, retail beef prices have fallen between three and seven percent depending on cut and quality. Changes in market prices take time to work backward through the supply chain, but fed and feeder cattle prices have fallen by almost 20 percent since early 2015.

The outlook for cattle and beef prices is muddled by competing effects of supply and demand. Supplies are certainly headed higher thereby signaling lower prices, but demand is also likely to head higher in the face of

lower retail prices and a stable-to-weaker U.S. dollar. Feedlots face mounting losses in early 2016: the implied net loss per head peaked in December 2015 at \$560 due to the high feeder cattle prices (see Figure 12). Feedlots will need to lower placement costs in order to swing back to profitability, and that fact may be the final straw to push prices down further throughout the year.

HOGS

Pork producers are also ramping up production in 2016 but demand has been increasing. The USDA estimates U.S. pork production will be up 2.2 percent this year as a function of both larger litters and higher slaughter rates. The hog industry has largely recovered from the Porcine Epidemic Diarrhea Virus (PEDv) outbreak of 2014, and that recovery has brought about higher hog supplies. China, the world's largest producer and consumer of pork, has tightened environmental restrictions on hog producers in the last two years, and the tighter regulation is just beginning to be reflected in the country's annual production numbers. Pork production in China fell just

Figure 11: Meat Production Trends and Expectations

U.S. Meat Production Trends

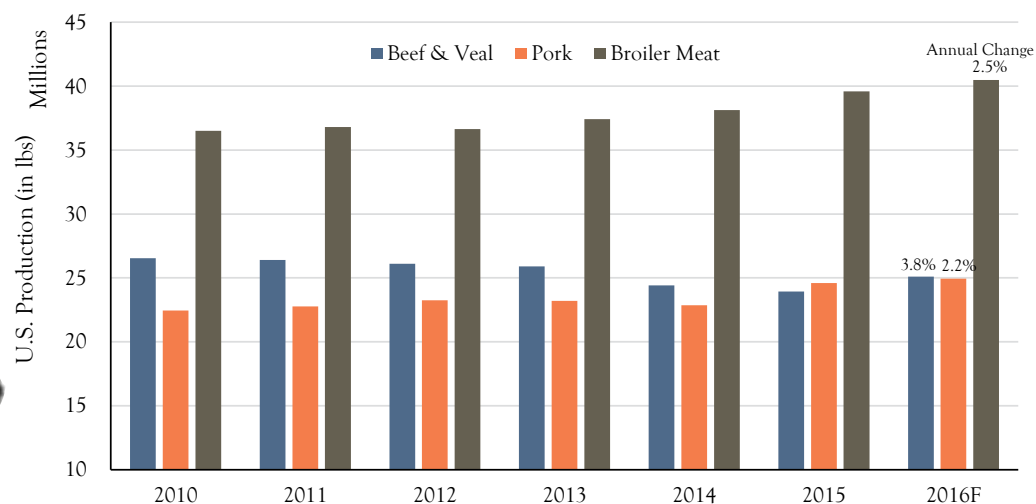
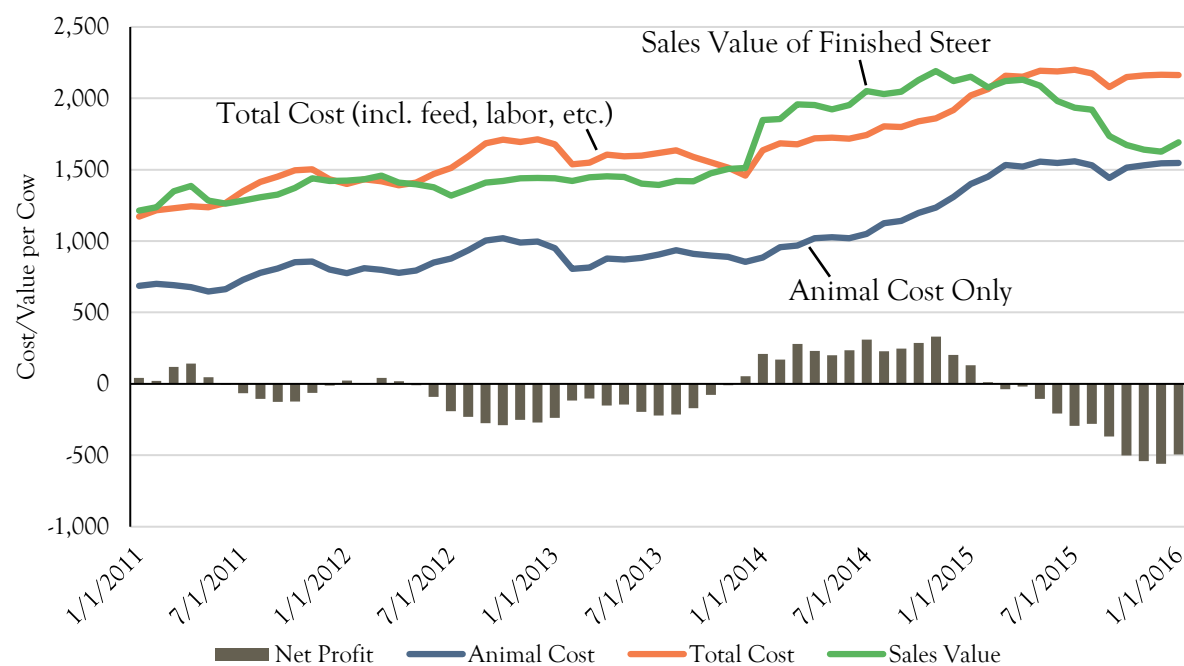


Figure 12: Historical Feedlot Operation Profitability

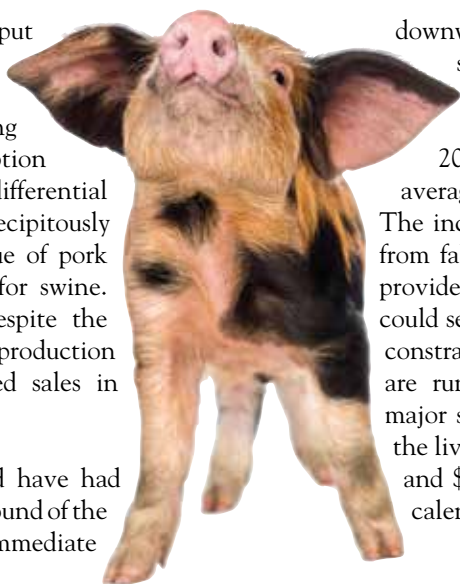
Iowa Feedlot Returns by Month



Source: Iowa State University Extension and Outreach, Estimated Livestock Returns

under one percent in 2015, and output looks to be steady or lower in 2016. Demand for pork looks good in early 2016 with the USDA projecting record high domestic consumption during the year. The retail price differential between pork and beef fell precipitously during 2015, and the relative value of pork likely spurred additional demand for swine. Export markets look attractive despite the strong U.S. dollar on a shortfall of production in China and better-than-expected sales in Japan.

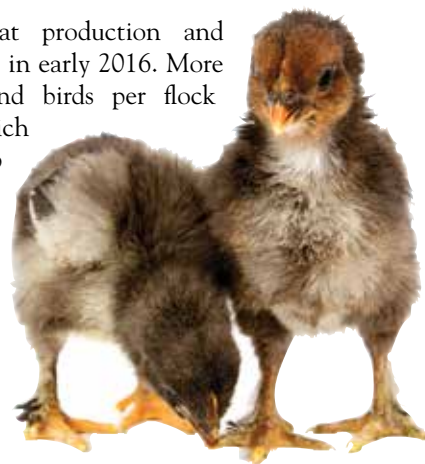
The factors of supply and demand have had mixed effects on hog prices. The rebound of the U.S. hog inventories put clear and immediate



downward pressure on live hog prices. Prices soared to \$85 per hundredweight in early 2014 as the PEDv outbreak leveled pig litters, but by the end of 2015, prices fell back below historical averages to nearly \$45 per hundredweight. The increase in pork demand will keep prices from falling too much further, and will likely provide support throughout 2016. Hog prices could see another dip if slaughter capacity gets constrained again in 2016, as most facilities are running at or near capacity. Barring a major supply-side disruption, the USDA puts the live equivalent price for hogs between \$50 and \$55 per hundredweight throughout the calendar year.

BROILERS

Lastly, broiler meat production and demand are both up in early 2016. More weight per bird and birds per flock are expected, which would drive up already high levels of frozen meat stocks. The Highly Pathogenic Avian Influenza (HPAI) outbreak of 2015 devastated many egg and turkey operations, but broiler production



went largely unaffected. When many foreign markets, including large importers like China and South Korea, banned the importation of U.S. poultry, production soon outpaced consumption and stocks built up. The large stocks in cold storage pushed broiler meat prices down with wholesale prices falling 27 percent from January to December. Prices stabilized at the end of 2015 and into early 2016, but the stocks will take time to draw down. Weekly prices have fluctuated a great deal since January 2016 due to the oversupply. Domestic demand has been excellent in early 2016 as consumers have enjoyed lower relative prices for chicken compared to pork or beef for the last 18 months. Exports are down but should pick up later in 2016 as the resurgence of HPAI was limited to one case in Indiana this January.

The mixture of supply and demand factors in the broiler industry indicate a flat-to-increasing price trend in 2016. The supplies of broiler meat continue to build, and production is not slowing down. However, U.S. per capita consumption should support the market prices that currently range from \$0.80 to \$0.90 cents per pound. Export markets could provide a boost later in the year depending on the international response to HPAI. Feed costs are likely to abate in 2016, so profitability in the poultry sector should be better in 2016 than in 2015.

Key Highlights

California grape crush in 2015 shows good yields but lower prices for most non-premium growing regions.

Hop growers expanded production in 2015 in response to higher prices and growing demand from the craft beer industry.

Demand for both wine and beer looks strong in 2016.

Since the 1970s, the U.S. has continually expanded as a producer and consumer of wine. Acres planted to wine grapes in California increased four-fold between 1970 and 2014, and in 2014, the U.S. ranked fourth in total world wine production behind France, Italy, and Spain. California viticulturists generated 3.8 million tons of grapes following the 2015 harvest, roughly equaling output from the record 2014 crush. As a result of the surprisingly good crush in 2015 and changes in consumer demographics, average California wine grape prices came under pressure last year. According to the Silicon Valley Bank (SVB) 2016 Wine Report, sales of low-cost, bulk wine were down 4.5 percent from 2014 while sales for wines more than \$9 per bottle increased an average of approximately 10 percent. The “premiumization” of wine consumption is causing a divergence of grape prices; premium growing regions such as Napa and Sonoma counties experienced increases in average prices paid to growers while bulk growing regions in the San Joaquin Valley saw decreases in average prices paid to growers.

Consumers are changing agricultural-based adult beverage preferences in other ways that threaten the U.S. wine

industry: the craft and specialty beer industry has been on a major run in the last ten years. Between 2006 and 2015, the number of craft beer establishments doubled, and the estimated revenues attributable to those institutions more than doubled. Hops, a distinguishing ingredient for many craft beers, has benefitted from the increase in production. Hops prices are up from \$2.05 per pound in 2006 to over \$4.38 per pound in 2015. Market prices have incented higher planted acreage in the principal growing regions of Washington, Oregon, and Idaho, and the economics have been good enough to spur hops farmers to plant in Pennsylvania, New Jersey, and Virginia among other East Coast states where craft brewers are closer to final markets. Small hopyards are becoming agritourist destinations, and millennial consumers appear to expend on craft beers and quality wines in equal amounts depending on convenience and value. The U.S. wine industry will certainly experience competition from craft brewing, but fortunately there looks to be more than enough demand to go around as the millennial generation matures into prime consuming age.

Figure 13: Wine Grape Market Trends

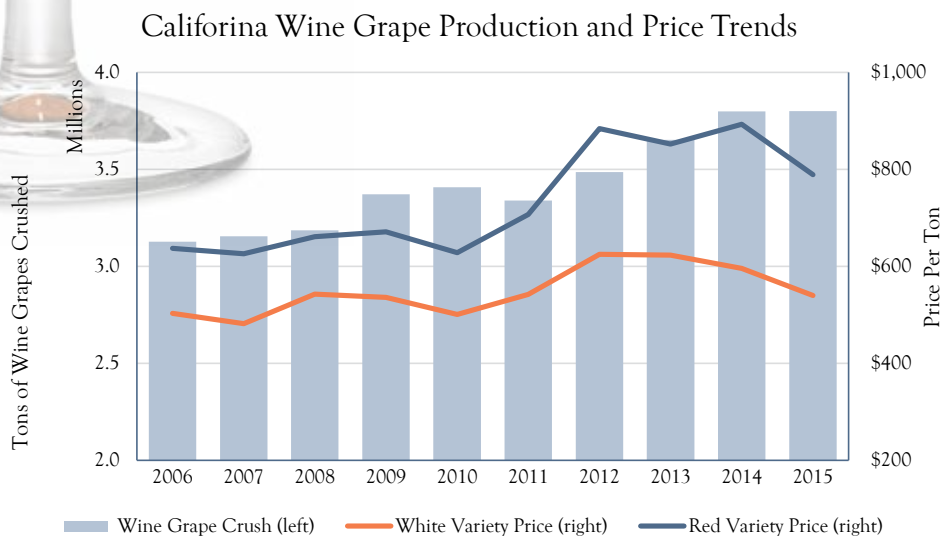
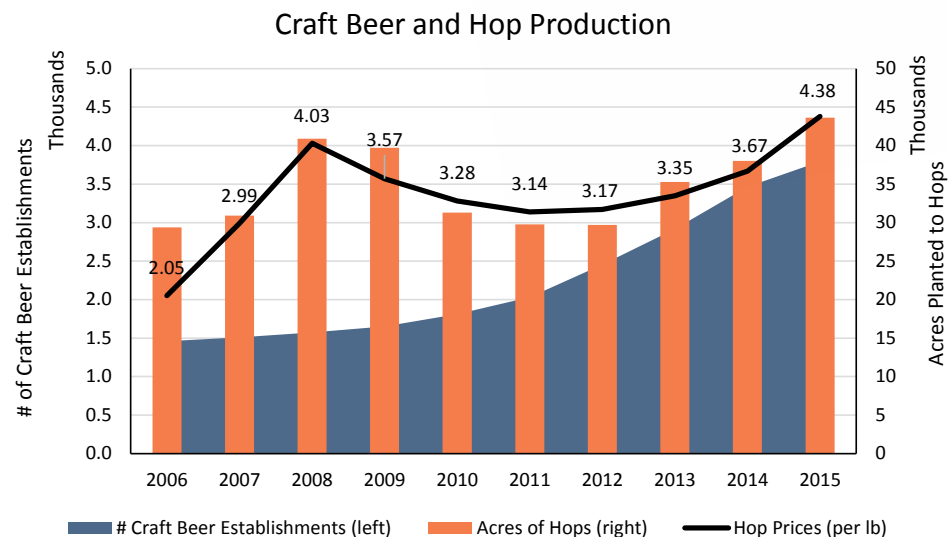


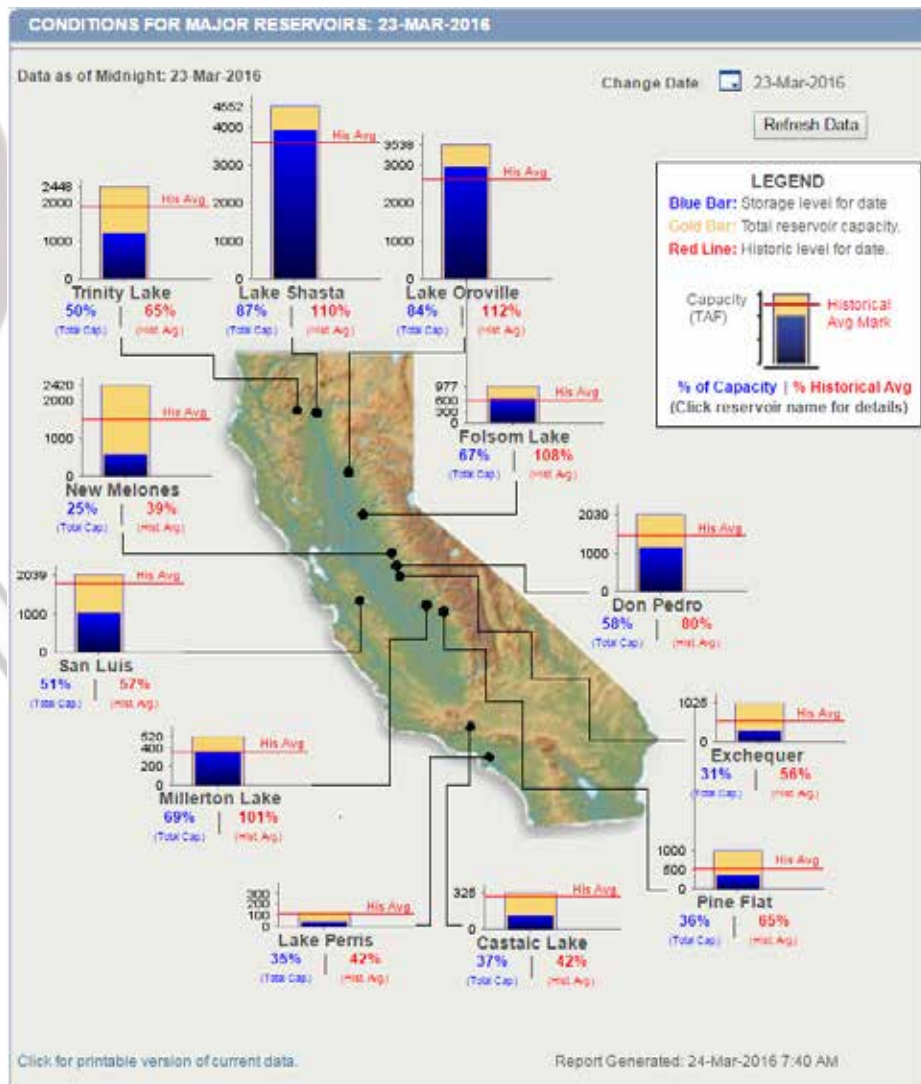
Figure 14: Craft Beer, Hop Production, and Prices



CALIFORNIA DROUGHT

The 2016 water year unquestionably ameliorated a parched California, but the Western drought is far from

Figure 15: California Department of Water Resources Reservoir Level Map (March 23)



over. Reservoir levels throughout the state received a much-needed recharge in March. Lake Shasta began 2016 at 31 percent of capacity, and Lake Oroville began the year at 29 percent of capacity. The reservoirs approached the end of March at 87 and 84 percent of capacity, respectively. Near the end of March, California snowpack was also much deeper than recent history standing at nearly 90 percent of average.

Despite the infusion of much-needed water and snow this water year, the drought lingers throughout the fruitful San Joaquin Valley. According to USDA expense data, irrigation costs have skyrocketed during the last few years climbing from \$400 million per year in 2009 to over \$1.1 billion in 2014. Drought Monitor reports show significant reductions in Northern California during the month of March, but the bulk of Central and Southern California remain in the most severe category of drought intensity. State Water Project officials announced in March agricultural water allocations at 45 percent of contracted amounts, a big improvement from the 20 percent allocations in 2015 and the zero percent in 2014. These increases should be met with cautious optimism in 2016, and conditions must continue to be monitored closely.

GMO LABELING LAWS

There is no more divisive topic in food and agribusiness today than the use of genetically modified organisms (GMOs) in the food system. GMOs can be a principal or secondary ingredient in many finished consumer food products, and GMO versions of corn and soybeans are a very high percentage of U.S. acres planted. Opponents of GMO crops argue that the long-term effects of human consumption of genetically engineered food products are unknown, that the genes can increase the power or potency of insects and disease, and that once in the food production system, the genes that have been modified can end up in unexpected places or mutating in unknown ways. Advocates of GMO foods argue that science has proven the resulting products are safe for human consumption, that they increase plant resistance to a number of stresses like drought or disease, and that genes can be modified to improve the nutritional content of foods. The debate took a new turn in 2014 when the state of Vermont enacted a law requiring labels to disclose the use of GMO ingredients in consumables that goes into effect in July 2016. Many food manufacturers and grocers have attempted to fight the legislation citing the burden it creates to have independent labeling of goods across state borders. In July 2015, the U.S. House of Representatives passed the Safe and Accurate Food Labeling Act of 2015 which disallowed states from enacting individual food labeling laws and instead created a federal standard for voluntary labeling of foods with GMO ingredients. The bill was referred to the U.S. Senate last July, and while it cleared the Senate Agriculture Committee early this March, it has failed to gain enough support in the wider Senate body, thus ending debate on the bill. July is rapidly approaching, and food companies are now starting to prepare for the possibility that state-based labeling laws are here to stay. These labeling requirements will increase the costs for food manufacturers, and those costs may be passed along to producers, consumers, or some combination of the two.

RESOURCES

The information and opinions or conclusions contained herein have been compiled or arrived at from the following sources:

- 1 USDA Farm Sector Finances (<http://www.ers.usda.gov/topics/farm-economy/farm-sector-income-finances.aspx>)
- 2 USDA Farm Sector Financial Ratios
(<http://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics/farm-sector-financial-ratios.aspx>)
- 3 USDA Foreign Agricultural Service Global Agricultural Trade System Data
(<http://apps.fas.usda.gov/GATS/Default.aspx>)
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(<https://apps.fas.usda.gov/psdonline/psdhome.aspx>)
- 5 United Nations Department of Economic and Social Affairs, Population Division (2015).
World Population Prospects: The 2015 Revision. New York, United Nations.
- 6 National Drought Mitigation Center's Drought Monitor
(UNL/NOAA; <http://droughtmonitor.unl.edu/>)
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- 8 USDA Office of the Chief Economist – 2016 Commodity Outlooks
(<http://www.usda.gov/oce/forum/commodity.html#commodity>)
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(<http://www.ers.usda.gov/publications/ldpm-livestock,-dairy,-and-poultry-outlook/.aspx>)
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- 19 IBISWorld U.S. Craft Beer Production Report (August 2015)
- 20 California Department of Water Resources (<http://cdec.water.ca.gov/index.html>)

ABOUT THE FEED

The Feed is a quarterly agricultural economic outlook for current events and market conditions within agriculture. The report is broad-based, covers multiple regions and commodities and incorporates data and analysis from numerous sources to present a mosaic of the leading industry information, with a focus on the latest information from the United States Department of Agriculture and their Economic Research Service. There are several regularly included sections like weather and major industry segments, but the author rotates through other industries and topics as they become relevant in the seasonal agricultural cycle. Where the report adds value to readers is through its unique synthesis of these multiple sources into a single succinct report. Please enjoy.

ABOUT THE AUTHORS

Author- Jackson Takach, Farmer Mac's resident economist, is a Kentucky native whose strong ties to agriculture began while growing up in the small farming town of Scottsville. He has since dedicated a career to agricultural finance where he can combine his passion for rural America with his natural curiosity of the world and his strong (and perhaps unrealistic) desire to explain how we interact within it. He joined the Farmer Mac team in 2005, and has worked in the research, credit, and underwriting departments. Today, his focus includes quantitative analysis of credit, interest rate, and other market-based risks, as well as monitoring conditions of the agricultural economy, operational information systems analysis, and statistical programming. He holds a Bachelor's degree in economics from Centre College, a Master's degree in agricultural economics from Purdue University, and a Master's of Business Administration from Indiana University's Kelley School of Business. He has also been a Chartered Financial Analyst (CFA) charterholder since 2012.

Contributing Author - Curt Covington, Farmer Mac's Senior Vice President, Agricultural Finance, leads the company's business development efforts, as well as the company's credit administration and underwriting functions. Curt's passion for rural America developed at a young age on his family's grape and tree nut farm in Selma, California. He has since leveraged his passion into a long career in ag lending, which spans almost four decades. In addition to his role at Farmer Mac, Curt is a respected leader in the agricultural mortgage industry and is actively involved in leadership roles within industry trade groups, including the RMA Agricultural Lending Committee, the Agricultural Lending Institute, The Agricultural Banking Institute of the Americas, and Federal Financial Institutions Examination Council (FFIEC).

Contributing Author - Brian Brinch, Farmer Mac's Vice President Financial Planning and Analysis manages the development of Farmer Mac's financial projections and plans, stress testing, and data analytics. Brian's interest in Farmer Mac began while attending Pennsylvania State University for his Masters in Agricultural and Applied Economics where he won the Outstanding Master's Thesis Award for his thesis titled "An Analysis of Farmer Mac Prepayment Penalty Designs". Prior to his study of agricultural economics, Brian received his Bachelor's degree in meteorology at Penn State. Today, he is the company's unofficial weatherman with an uncanny ability to predict the weather more accurately than any news station in the country. Brian is also a CFA charterholder and FRM Certified.

ABOUT FARMER MAC

Farmer Mac is the stockholder-owned company created to deliver capital and increase lender competition for the benefit of American agriculture and rural communities. For more than a quarter-century, Farmer Mac has been a vital partner in helping America's rural lenders meet the evolving needs of their customers, bringing the financial strength of the nation's premier secondary market for agriculture right to their customers' farms and ranches. Lenders of all sizes use Farmer Mac's broad portfolio of loan products to offer more financial choices to their rural customers, helping them keep pace with today's capital-intensive agricultural industry.

Contacts

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For inquiries:
Megan Pelaez
Director - Communications
MPelaez@farmermac.com
202.872.5689
.....

Follow the author on Twitter
@JacksonTakach
@FarmerMacNews



**1999 K Street, N.W. Fourth Floor
Washington, DC 20006
Phone: 800.879.3276
Fax: 800.999.1814
www.farmermac.com**

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