The Feed

Farmer Mac's Quarterly Perspective on Agriculture

Spring 2018



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ABOUT THE FEED

The Feed is a quarterly 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 authors rotate 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.

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A MESSAGE FROM CURT COVINGTON

During the financial crisis just ten short years ago, I had the privilege of serving as Chairperson of the American Bankers Association's National Ag Banker's Conference. Given the state of the banking industry, there was an obvious fear that no one would show up. I was convinced we needed a show-stopping session that would attract bankers from across the country. That person turned out to be the Co-CEO of Whole Foods, Walter Robb. Mr. Robb gave a masterful presentation on all accounts. However, the reaction from more than a few bankers after the presentation surprised me. I heard (in one form or fashion) "Whole Foods is just a fad, it will never last." Amazon would disagree. It's a good thing that farmers don't think that way, or we'd still be plowing fields with oxen.

No surprise to most reading this edition of The Feed, the average consumer today has little connection with the farm or rural America and probably has no understanding of how advances in farming have benefited their lives and the environment. At the same time, there are those who would suggest that farmers are slow adopters of technology, and as a result, that they are not in a position to feed a growing world population. Don't tell today's progressive young farmers that! I prefer to think of farmers as being a pragmatic bunch that will adopt change when the technology is proven and when it makes economic sense.

Over the past several years, I've had the opportunity to meet many visionaries in "Ag Tech" whose work represents a dynamic break with traditional farming practices. Although farmers may still be walking their fields to kick a few dirt clods, fewer of them are making decisions based on intuition or experience alone. Curiously, in the face of a fifth consecutive year of low grain prices, the pace of technological adoption on the farm across the Midwest is increasing. What's the attraction? What's the compelling story? Simply put, technology has given farmers the ability to manage costs and gain operating efficiencies through better yields while consuming less water, fertilizer, chemicals, and labor. That's a good thing for both farmers' and consumers' bottom lines alike. After all, U.S. agricultural producers deliver the lowest-cost food anywhere in the world, and innovation will help them continue that tradition for years to come.



PRODUCTION AND MARKET PRICE PERCEPTUAL MAP Winter 2017 Spring 2018 **Favorable Production ALMONDS Environment Livestock Sector** CATTLE/CALVES \mathfrak{B} **CITRUS Feed Grains and Oilseeds** CORN COTTON DAIRY Higher Prices Lower Prices -Fruit and Tree N HAY HOGS SOYBEANS WHEAT WINE GRAPES **Unfavorable Production** Environment

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FOOD PRICES AND PREFERENCES

(resource 1, 2, 3, 4, 5)

By Annemarie Kuhns

Key Highlights

Retail food prices have been declining in recent years due to lower input costs and increased competition

Millennial shoppers devote more spending to fruits, vegetables, and prepared foods compared to older generations

Lower retail food prices do not necessarily translate to lower farm-level prices, as retailers may reduce margins to compete

The year 2017 marked the second consecutive year that average grocery store (i.e., food-at-home) prices declined, falling by an additional 0.2 percent after a 1.3 percent decline in 2016. It was largely considered an anomaly when price levels fell in 2016, as overall prices had not declined at the grocery store since 1967. However, deflating prices and lower-than-average inflation have become a new norm. While grocery store prices can be volatile year to year, the average rate of inflation for foodat-home has slowly been declining. Looking at the 20-year moving average, retail food prices rose 4 percent in 1998, 3.1 percent in 2008, and 2.1 percent in 2017 (Figure 1).

This downward trend may continue. Looking ahead to 2018, USDA Economic Research Service (ERS) forecasts that retail food prices will rise 0.5 to 1.5 percent, again falling below the 20-year historical average. In fact, this below average annual increase after two straight years of deflation would still leave overall price levels in 2018 lower than 2015. While food prices are, on average, expected to rise in 2018, some major food categories could see another

Figure 1: Annual Change in Food-at-Home Prices and 20-Year Moving Average, 1998-2017



year of declines. USDA currently predicts prices for fats and oils, vegetables, processed fruits and vegetables, and pork may decrease.

The prices that consumers pay at the grocery store are driven by a combination of factors. Changing farm-level prices, other input costs, retailer decisions, and consumers' tastes and preferences all play a role in influencing food prices. During 2016 and 2017, lower food-at-home prices were driven, in part, by decreasing input prices. Domestic production of many agricultural commodities, such as wheat, eggs, cattle, and soybeans, were high, placing downward pressure on prices from farm to retail. Lower oil and energy prices decreased both the cost of production and transportation. The U.S. dollar strengthened from 2014 to 2016, which not only makes imported foods less expensive but also keeps more domestic production in the U.S. market.

Grocers cite diminishing retailer margins as another impetus for falling food prices. In June, Kroger reported a decline in earnings due to pressure from rising competition as well as deflation. Somewhat counterintuitively, price deflation may breed more competition among existing retailers, driving prices even lower. In the face of lower prices and more sellers, both established and new retailers may offer deeper discounts to entice consumers to shop at their establishment over the competition. Therefore, even if prices began to creep up at the farm and wholesale level, retail prices could remain low. Retailers must also adapt to consumers' changing tastes and preferences. Of particular interest in today's market is how preferences differ by age (with a specific emphasis on Millennials). Millennials, individuals born between 1981 and the mid-2000s, are now the largest living generation in the United States—surpassing Baby Boomers. As such, their purchasing behavior heavily influences the current retail landscape.

A recent ERS report analyzes 2014 grocery store scanner data to observe how Millennial's shopping habits differ from those of older shoppers. The analysis uncovers several interesting shopping pattern differences between generations. Millennials, on average, go to the grocery store less frequently and spend less on groceries (food-athome) each month than other generations. Millennials also demand healthier and less processed food, like fruits and vegetables, when making food-at-home purchases. At the same time they also have a stronger preference for convenience than the other generations analyzed.

Aggregating monthly expenditures at a household level, the study calculates and compares shares of expenditures for major food categories. This research confirms that Millennials spend a larger share of their food-at-home dollars on fruits and vegetables, snacks, prepared foods (defined as ready to eat or heat and serve items), pasta, and sugar and sweets, while they devote the least to grains, white meats, red meats, and milk (Figure 2). While Millennials spend a lower share of their food budget on these items, it does not necessarily mean they are eating less – they could be buying lower-priced meats or grain products, buying them in more prepared forms, or eating more away from home or at restaurants.

The variation in overall food expenditures between the generations implies that younger consumers have a stronger preference for eating out at restaurants or fast food establishments. Data from the 2014 Consumer Expenditure Survey, conducted by the U.S. Bureau of LaborStatistics, support this finding. Survey respondents under the age of 25 indicated they spent 6 percent of their budgets on eating out compared to 4.8 percent spent by respondents between the ages of 55 and 64 years old.

If these trends persist in the retail food environment, what will this mean for the future of the farm-to-retail supplychain? As food retailers consider their positions within the current competitive environment, they are likely to hone their pricing strategy and tailor their offerings to meet changing consumer demands. Changes in pricing strategy, generally impact the retailer's bottom line, not the farm or wholesale price paid for an item. However, other aspects of the supply-chain may also need to adapt in response as farmers did in previous years with the increased demand for organics and non-GMO products.

Figure 2: Retail Food Expenditure Shares by Generation for Select Food Categories





FARM INCOME AND EQUITY OUTLOOK

(resource 6, 7

Key Highlights

USDA projects net farm income and net cash income to decline in 2018, after rising last year

Income is expected to decline for most commodities, but some commodities will fare better than others

Despite the continued low-income environment, farm wealth, led by rising national farm real estate values, is expected to increase





Figure 3: Net Farm Income and Net Cash Income are Both Projected to Decline in 2018

As winter fades into spring, many U.S. farmers await the thaw so they can begin their annual production cycle anew in 2018. Farmers may still be finalizing their annual production decisions, but the initial income outlook from the USDA's Economic Research Service suggests they are likely to face another year of lower profitability. Overall, net farm income (NFI) is projected to fall 6.7 percent to \$59.5 billion in 2018 (Figure 3). After adjusting for inflation, this would be the lowest level of NFI since 2002, and a 55 percent decline from the 2013 peak.

NFI accounts for inventory adjustments and other noncash income and expenses items, like the potential rental value of farmer-occupied houses and the economic depreciation of farm machinery. This makes NFI a more comprehensive measure of economic profitability, but farmers can't use these noncash income and expenses streams to pay their bills. The sector's net cash income (NCI), the difference between cash revenues and expenses, is a better measure of the cash flow farmers have available to cover their family's living expenses or repay their creditors. NCI has also declined since 2012, falling 37 percent, but that fact paints a more resilient picture of the farm sector's profitability.

In 2018, NCI indicates the farm sector generates higher cash flows than the more comprehensive NFI data indicate. However, the USDA currently projects an uptick in expenses to bite into flat commodity revenues, leading NCI to decline by more than 5 percent to just under \$92 billion (Figure 3). This suggests farmers may have less money available to meet their family needs and pay down their debt this year. But like any forecast, the USDA's initial projection of 2018's profitability remains uncertain.

As covered in past issues of The Feed, the USDA's initial farm income forecasts tend to be conservative. Accordingly, when farmers' actual revenues and expenses are tallied, the result has typically been higher than the USDA initially expected. After accounting for the range



Figure 4: Farm Business Average Net Farm Income Projected Down Across Most Commodities

of differences between actual NCI levels and the USDA's first NCI forecast over each of the last 25 years, the current projections could end up being revised to between \$96 and \$107 billion. This would mean that the year's NCI outlook has a good chance of being flat to somewhat higher, even though the USDA currently projects a decline.

Of course, even if the farm sector's income level ends up being relatively stable to higher overall, it does not mean profitability on all types of farming operations will be impacted equally. The USDA also releases a forecast of the average net cash income for U.S. farm businesses – operations where the operator's primary occupation is farming, or gross farm income exceeds \$350,000 – by production specialization and region. The data suggest NCI could decrease for most major commodity specializations compared to last year. Only cattle/calf farm businesses are predicted to see NCI rise in 2018, while dairy and wheat farm businesses are projected to see their NCI decline by double digits (Figure 4).

Although income could be tighter on many operations this year, the USDA paints a more optimistic picture for the sector's balance sheet. Farmers' equity is currently expected to increase by 1.6 percent in 2018. Since farm real estate accounts for the majority of farm assets (82.6 percent in 2016) the projected increase is driven by the USDA's expectation that farm real estate asset values will continue to appreciate. The current projections put farm real estate assets up 3.3 percent in 2017 and another 2.1 percent in 2018. On the other hand, the USDA projects liquid holdings like commodity inventories and financial assets to decline, as lower prices reduce the value of stored inventories, and leads farmers to draw down their savings. Reductions in these assets are expected to lead to another year of declining working capital.

Because farm sector equity is the difference between the sector's assets and debt, the USDA's predicted slowdown in farm debt growth also contributes to the rise in farm equity. Non-real estate borrowing is predicted to remain flat, rising by 0.6 percent in both 2017 and 2018. However, recent lender survey data from the Kansas City Federal Reserve suggest higher growth in nonreal estate debt volumes at commercial banks in the third quarter of 2017. The USDA also projects farm real estate debt growth will slow to 4.5 and 1.2 percent in 2017 and 2018, respectively, after rising at an annual percentage rate of more than 6 percent per year from 2012 to 2016. Unlike non-real estate borrowing, lenders appear more pessimistic about real estate backed loan volume growth in the fourth quarter of 2017.

The USDA's farm sector income and balance sheet forecasts can also be combined to gauge the outlook for farm sector's financial position. Comparing the ratio of working capital to cash expenses provides an intuitive measure of farmers' liquid assets to continue their operations without additional revenue streams. The USDA's forecast of lower working capital and higher expenses suggests that the farm sector's liquidity position could continue to tighten in 2018 (Figure 5). However, their outlook for rising farm real estate assets and slower debt growth means that the farm sector's strong overall solvency position should provide some flexibility to operators who need to right-size their balance sheets to improve liquidity while the sector waits for prices and profitability to rise again in the future.

Figure 5: Farm Sector Solvency Position Remains Strong, but Liquidity Has Declined



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Today, those same leading indicators show a realignment of rural-state economies with the overall U.S. economy, led by lower unemployment rates, higher wages, and expanding housing permits.
Leading indicators in rural-state economies showed resilience in 2017. The Federal Reserve Bank of Philadelphia calculates a leading index of economic activity by state for each month. This index looks at major indicators like manufacturing data, housing data, interest rates, and unemployment data at a state level and

predicts economic growth for the next six months. Figure

6 shows the national average leading index from 1982

2016 Conditions in this economic recovery are very localized, and off-farm job growth has been slower in many agricultural-centric counties

The farm economy is now five years from its peak. Income from farming and ranching has fallen by approximately

50 percent since 2013, and the USDA estimates that

more than \$60 billion of annual income has been taken out of the agricultural economy in that time. In early

2016, authors of The Feed looked at economic indicators

in agricultural states that showed a spillover of lower

agricultural income into the general rural economy.

by declines in farm income

Leading indices show improvement in highly agricultural state economies since 2016

Key Highlights 4 The rural non-farm economy was affected 3

Percent (Predicted Growth Rate)

through December 2017, paired with an average leading index of "Rural States" - states in which a high percentage of the population lives in non-metropolitan areas, and agriculture production represents a relatively high proportion of the state gross domestic product. Usually, the two series move in tandem. However, there are two periods in which the rural state economies performed worse than the general economy – during the mid-1980s farm crisis. and from 2014 through the end of 2015, when commodity prices contracted significantly. However, many of the components of the leading economic indicators turned positive in 2016. Unemployment rates in highly rural, agricultural states like Iowa and Minnesota dropped below national averages, and permits for new buildings began inching up. And wages in rural communities have risen an average of 2.86 percent on an annualized basis in 2017.

While perceived strength in the general economy is certainly welcome news, there are some signs that the recovery is not as widespread as it may appear. Courts in the 7th and 8th Circuits that cover many ag-intensive states reported a slightly increased number of bankruptcy proceedings during 2017; the numbers are not vet alarming, but any increase is an indication of prolonged stress. Additionally, wage growth in agriculturally-focused counties across the U.S. has been slower than in all other counties (3.89 percent for all others). Job growth in 2017 has been led by the service industry (i.e., education, healthcare, leisure, and hospitality, etc.), which has not expanded as much in agricultural areas as compared to urban and suburban areas. Clearly, the loss in farm income has yet to be replaced by off-farm income in many rural communities, and that is likely why the recovery is not uniformly perceived.



Figure 6: Rural and National Leading Economic Indicator Trends

RURAL ECONOMY

(resource 8, 9, 10)

WEATHER

(resource 11, 12)

Key Highlights

La Niña conditions have been prevalent across the equatorial Pacific through the winter, resulting in another abnormally dry rainy season in California

Drought conditions are likely to persist in the southern Plains

Over the fall and winter, La Niña sea temperatures developed over the central Pacific Ocean. This is one of the key factors behind the return to dry, and likely drought, conditions in California on the heels of the outstanding 2016-2017 rainy season. Snowpack levels are deficient in the Sierra Nevada mountains, which does not bode well for reservoir levels and water distributions during the upcoming growing season.

Throughout the Midwest, precipitation and soil moisture levels are expected to be reasonably close to average heading into the spring planting. However, there may be bouts of colder-than-normal weather as the La Niñainfluenced jet stream is able to tap into the residual cold air over Canada. The southern Plains are likely to see drought conditions expand over the late winter and through the spring. The Gulf Coast and Southeast may begin to see more seasonally normal amounts of precipitation develop during the spring, which may reduce marginal drought conditions throughout this region.

Commodity markets for grains have recently been buoyed by weather-related impacts to crops in South America. The abnormally wet conditions in Brazil and dry conditions in Argentina are likely to persist through harvest.



Figure 8: U.S. Soil Moisture Anomaly



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CORN AND SOYBEAN (resource 13, 14, 15, 16, 17, 18

Key Highlights

Several years of historically high production have led to record corn and soybean stocks

Weather may lower Argentina's output this year, which could provide additional export opportunities for U.S. producers

USDA's 10-year baseline projects price to remain near current levels as high demand helps counterbalance the additional supply

The 2017/18 marketing year is shaping up to be another year of high production and pricing pressures for most U.S. corn and soybean farmers. Despite some summer weather worries, the season's harvest has largely been a bountiful one. Final USDA estimates indicate a record 176.6-bushel per acre national average corn yield. Soybean yields were the second-highest recorded national average, at 49.1 bushels per acre. The ample harvest has led to increasing stockpiles of both commodities. The USDA's most recent Grain Stocks report shows corn and soybean supplies were both at record highs in December 2017.

Despite the record corn and soybean stocks, the USDA still expects prices for the 2017/18 marketing year to remain in line with last year's prices. Uncertainty around foreign supply disruptions and corn and soybean demand could still lead prices to rise or fall in the first half of 2018. On the supply side, the corn and soybean industries' focus shifts to South America to gauge the likelihood of weather-related crop disruptions. In Brazil, most growing regions have received rainfall at least at normal levels and the wet-weather could impact planting. However, Argentina's corn crop has dealt with





excessive dryness and will likely come in smaller than the industry initially expected.

Due to Argentina's smaller crop and current price competitiveness, U.S. corn export shipments have been running ahead of their 2016 pace over the last several months. Continued export strength could provide further upward pressure on corn prices and allow producers to lock in higher-than-originally-expected corn prices this year. On the other hand, soybean exports to China were down by nearly 11 percent by volume in 2017, due to additional competition from Brazil's historically large crop and lower protein levels in the 2017/18 U.S. soybean crop. U.S. exports could face additional competition as South America's new harvest enters the global supply chain.

While uncertainty around the South American supply or foreign demand could provide opportunities this year, both industries should expect future overall price levels to be relatively similar to today's levels. High demand has helped to at least partially offset several years of large supplies. The USDA's new 10-year agricultural baseline projects that this trend will continue, which means each industry should make progress toward whittling down their large ending stocks; however, given the current relative balance between supply and demand, the USDA projects that progress will be relatively slow. As a result, prices are expected to remain rangebound near today's levels over the next decade (Figure 9).

While the USDA's baseline is meant to be a useful guide to understanding the potential long-run outcomes for U.S. agriculture, it assumes current conditions will continue and that normal weather persists across crop years. Unforeseen weather disruptions, as well as supply and demand shocks, will likely cause actual prices to fluctuate more widely each year. For example, a substantial drought in a major corn or soybean production region could lead to a short-term lift in prices. Alternatively, if trade tensions with China continue to rise, and China follows through by restricting its more-than-one billion bushels a year import of U.S. soybeans, producer prices could suffer. As always, producers will need to remain ready to implement their marketing strategies to mitigate the risk associated with price swings and effectively capitalize on any pricing opportunities that arise.

Figure 10: China's Wheat Stocks-to-Use Up Sharply; ROW Stocks More Moderate

WHEAT

(resource 11, 13, 14, 19)

Key Highlights

Winter wheat acreage is at its lowest level in more than 100 years

Global production remains high, but nearly half the world wheat stock is held in China

World trade agreements could provide longer-term headwinds to U.S. producers if export competitors gain tariff-free access to key markets

As we prepare to transition from winter to spring, the 2018/19 wheat season is already well underway. The USDA estimates that growers planted 32.6 million acres of winter wheat in the fall. This is the lowest winter wheat acreage in 109 years, and a small decline from last year, when acreage dropped more substantially in response to low wheat prices in 2016. Despite these historic lows, many industry participants expect further acreage declines. While prices have rebounded somewhat, they remain low compared to the recent high price environment, and producers were expected to consider more profitable alternatives.

Now that there is a clearer picture of winter wheat plantings, the wheat supply-chain will be keeping an eye on weather developments. Many wheat-growing states in the northern Plains and in the Pacific Northwest have had relatively favorable weather. However, the southern Plains region has been dry, and the winter wheat crop in Kansas, Colorado, and Oklahoma have been exposed to cold stress due to a lack of snow cover; continued dry conditions could further reduce the crop's quality.



The industry will also be keeping a keen eye on developments in global wheat markets. Like most grain commodities, rising production has led to high world stocks over the past several years. Nearly half of the world's wheat stockpile is in China, where domestic support programs have encouraged additional production. If Chinese stocks and demand are stripped out of the world totals, the rest of the world's stocks-to-use ratio has been trending downward since the 2009/10 marketing year (Figure 10). On the other hand, Chinese stocks-to-use have increased sharply. Since China's wheat stocks are unlikely to be re-exported, wheat markets are somewhat tighter than they would otherwise appear, and therefore wheat prices may be more susceptible to global production disruptions or upticks in demand.

America's wheat farmers are poised to benefit if world wheat prices improve, having exported upwards of half the wheat crop in recent years. But world trade agreement developments could mean more long-run competition for the Japanese wheat market, which currently ranks as the second largest market for U.S. wheat. Japan finalized negotiations on a trade agreement with the European Union, one of the U.S.'s competitors in world wheat markets, at the end of 2017. Japan and the other ten remaining Trans-Pacific Partnership (TPP) countries could also finalize that pact this spring. If TPP moves forward without the U.S., it would mean U.S. wheat growers miss out on the \$340 million potential boost in wheat exports the USDA projected could occur under TPP, and could also allow Canada and Australia, who are TPP members and U.S. wheat export competitors, to cut into the U.S. export market share to Japan.

(resource 20, 21, 22)

2,500

Key Highlights

Beef cattle inventory increased 1.6 percent from 2017 to 2018

Demand for beef products increased in 2017, and it looks to gain in 2018 as well

Profit margins increased across the cattle supply chain in 2017 and could maintain some of that momentum in 2018

Beef and beef cattle supplies continue to build as the U.S. herd expansion enters its fourth year. The U.S. beef cattle inventory increased by 1.6 percent in January 2018 compared to 2017, and the inventory has increased more than 2.7 million head since bottoming in January 2014. Beef cutout efficiency has leveled off in recent years, after decades of rising per-cow dressed weights. The amount of commercial beef that can be taken per cow leveled off at around 900 pounds per head in 2014 and has remained unchanged since; that is a 32 percent increase over average cattle weights from the 1970s. Despite recent increases in headcount and size, the supply of U.S. beef products in cold storage is down 14 percent, limiting the effects of excess stores on market prices.

Beef demand has been exceptional throughout 2017, with lower retail and wholesale beef prices spurring higher rates of consumption in 2017. This trend has been particularly pronounced in Asian markets like Japan, South Korea, and Hong Kong/China, where the once-dominant Australian beef is seeing increased competition. Retail beef prices fell to around their 10-year inflation-adjusted average, giving the



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

Total Cost

••••• Animal Cost

U.S. consumer greater incentives to select beef over other animal proteins and animal protein substitutes. Per capita, beef consumption increased in both 2016 and 2017, the first material multi-year increase in roughly 20 years. Demand looks strong heading into 2018, with domestic prices and export volumes holding steady in November and December of 2017. Foreign competition could stiffen in the coming year if the Trans-Pacific Partnership trade deal continues without U.S. participation, as Australia and Canada would gain greater access to growing Asian demand.

Net Profit

Combined with lower feed costs, strong demand and stabilizing supply in 2017 led to increased profitability at the feedlot level, particularly from April to July (see Figure 11). The improved profitability coincided with an increase in feeder cattle futures of nearly \$25 per cwt between January and June of 2017. Live cattle prices were slower to react, but they are up \$10 per cwt in February 2018 compared to 2017. It typically takes between six and twelve months for better economics to reach the cowcalf operators in the form of higher animal prices (see dotted line in Figure 11), so if the market holds, ranchers could continue to see price improvements in the spring and summer months. The primary threat to this positive outlook is foreign demand. The ongoing negotiations with NAFTA partners and the absence of competitive trade agreements in Asia may cloud the crystal ball of cattle markets in 2018.

Sales Value

CATTLE

(resource 23, 24, 25)

Key Highlights

U.S. milk and dairy product supplies continue to increase, but at a modest pace

Global dairy production rebounded throughout 2017, pressuring world prices lower

Increased competition in world markets will pressure dairy prices lower in 2018

Growth in the U.S. dairy supply leveled off somewhat in the fourth quarter, with slightly lower milk herd inventory and slightly higher output per cow. Continued declines in the California dairy herd were offset by herd increases in Idaho, Arizona, and Texas, and by greater milking efficiency in all producing states, but particularly in Wisconsin. Stocks of milk-fat products such as butter and cheese are flat in 2018, and prices in recent years have favored fat products over fluid and dry products. Early 2018 forecasts from the USDA show a continued increase in per-cow milk output, which suggests a 1.5 percent increase in milk production in 2018.

If U.S. production continues to increase, finding outlets for American dairy products will be of the highest importance. Domestic demand has been modest throughout 2017, and it has failed to outpace increased supply leading to higher ending stocks of nonfat dry milk, cheese, and butter. Exports were a highlight of 2017 with U.S. prices considerably lower and thus more competitive than those in Europe and Oceania. As a result, dairy exports ended 2017 up nearly 15 percent from 2016, with growth led





by strong global demand for cheese and nonfat dry milk. Demand has been up from most of the U.S.'s major dairy trading partners, but China has been the largest driver, with a 50 percent increase in the value of dairy product exports. Mexico remains the largest market for U.S. dairy, highlighting the importance of NAFTA trade to the U.S. dairy sector.

The most compelling story in the dairy sector is the activity in foreign markets. Milk production in the EU and Oceania rebounded significantly in 2017, driven by an increase in market prices. As production increased, world dairy product prices began to converge in the second half of 2017. In January 2018, world prices for non-fat dry milk products, cheese, and butter were nearly identical

between the U.S., the EU, and Oceania, making U.S. dairy less competitive in the world markets, particularly China. U.S. dairy exports to China will be challenged by producers in New Zealand who recently signed an improved free trade agreement with China in 2017.

The increasing competition in foreign dairy markets combined with slowly rising production will likely have a negative effect on U.S. milk prices in 2018. In January, the USDA projected a Federal Class III milk price of \$14.65 in 2018. Producers spent much of last year oscillating around breakeven profitability (see Figure 12), but the demand-side challenges producers will face in 2018 may put many producers firmly in the red for much of the year.

DAIRY

(resource 26, 27, 28)

Key Highlights

U.S. citrus production, particularly for oranges, has declined since the early 2000s

Hurricane Irma expected to reduce Florida's orange crop, but California production also expected to decline

Domestic demand has waned as consumers drink less orange juice

At the end of August, as the 2016/17 citrus marketing year was winding down, the USDA released its annual update of the U.S. citrus industry. The data show that 2016/17 bearing acreage and total utilized production continued to decline, falling 4 and 11 percent, respectively, relative to last year. Going back further, utilized citrus production is down 40 percent over the last decade and 56 percent relative to the record 1997/98 growing season. The biggest driver has been the widely-reported decline in U.S. orange production.

Since citrus greening was first discovered in Florida back in 2005, the state's bearing orange acreage has fallen by nearly a third. Because much of the Florida crop is destined for processing, the result has been smaller supplies of processed orange products like orange juice. However, declining orange production has not been limited to Florida. Over the same period, California acreage, which has historically been used to supply fruit to consumers, has declined by nearly 20 percent. Unlike Florida, where disease has been a primary culprit, California's producers have sought out either less water-intensive crops or alternative citrus options, like mandarins, which have been popular with consumers. Source: USDA, NASS Citrus Fruits Annual Summary

Orange production is likely to continue its downward trend in the upcoming 2017/18 marketing year. Over the last several months, USDA field surveys indicate fewer fruit per tree in California, and the crop's production is currently projected to be down 9 percent. Tight fresh market orange supplies over the past year have already resulted in higher prices, and the further production declines in California should help support continued higher prices, allowing growers to at least partially make up for lower production levels. As we noted in last quarter's look at natural disasters and agriculture, Florida's citrus producers were substantially impacted by hurricane Irma. The USDA's updated Florida orange production forecast suggests that the state's supply may be off by upwards of 33 percent, and reach levels last seen in the 1940s.

Bearing acres (thousands)

Additional orange imports could be headed for the U.S. to help shore up the domestic supply, but current world supply conditions mean that the additional imports could cost more than last year. Brazil, the world's largest orange juice producer, has had weather problems, leading to an expected 16 percent drop in production. Since Brazil exports most of its orange juice production, its supply disruption is expected to reduce world stocks and put upward pressure on prices. Limiting the potential for rising orange juice prices is U.S. consumers' declining orange juice consumption, which has fallen by nearly fifty percent over the last 15 years, according to domestic consumption data from the Foreign Agricultural Service. Although hurricane Irma has clearly had a major impact this year, overcoming lower demand and greening remain the keys to the industry's long-run outlook.



Figure 13: Citrus Bearing Acres in California and Florida by Marketing Year

CITRUS

face significant headwinds in the coming years.

(EPA) issued a Notice of Data Availability regarding the

Renewable Fuel Standards (RFS) blending requirements.

The EPA has the authority to lower the amount of ethanol

and biodiesel that is mandated for production under the

RFS if certain market conditions are met, and the notice

trucks picked up in 2016. According to EPA data, the U.S.

automotive fleet increased average adjusted fuel economy

3.2 percent to 25.6 miles per gallon. That is an increase of

33 percent since 2004, when the fuel efficiency bottomed

out at 19.3 miles per gallon. Better fuel efficiency reduces the

amount of gasoline consumed and thus reduces the demand

for ethanol. The U.S. biofuel industry outlooks appear stable

in the short and medium terms, but biofuel producers could

The Feed - Spring 2018 14

Political and market headwinds limit biofuel upside in the long run Production of ethanol and biodiesel is expanding again after a brief period of slow growth. In early 2017, there were 198

Key Highlights

Increases in U.S. ethanol and biodiesel

production have been matched with increases in demand

Ethanol exports are up on increased demand from Brazil and China; in both

fuel use mandates

operational ethanol plants in 28 states capable of producing just under 16 billion gallons of ethanol per year under normal operating conditions. Production capability has increased by more than 1.1 billion gallons per year since 2014- enough fuel production to use an additional 390 million bushels of corn. Similarly, biodiesel production has ramped up in recent years, with 99 operational plants in 37 states capable of production 2.4 billion gallons of biodiesel. Biodiesel refineries have increased production by more than 300 million gallons since 2015 – that is enough fuel production to use an additional 200 million bushels of soybeans.

These increases to supply are in response to recent increases in biofuel demand. U.S. drivers consumed more motor gasoline in 2016 and 2017, driving up the demand for ethanol for blending. Gasoline consumption increased to levels not seen since 2005, and while still below peak usage in 2007, this increase in gasoline consumption has been a major driver for fuel ethanol usage. Biodiesel has also seen an increase in usage in recent years, due to greater adoption of advanced

and alternative-fuel vehicles. Even with the expiration of a biodiesel blending tax credit in 2016, biodiesel consumption was up in 2017. In addition to greater domestic consumption, elevated demand from export markets have helped fuel the expansion. The U.S. exported more to Brazil in the first seven months of 2017 than in all of 2016, and total exports of both ethanol and biodiesel are up by almost 29 percent through July compared to the first seven months of 2016. In September, China instituted a 10 percent ethanol fuel blend mandate to be reached by the year 2020. The Chinese ethanol industry will develop around this mandate, but refiners will likely turn to international markets to meet the demand in the short term, and U.S. ethanol exports to China jumped 22 million gallons in December.

While the current market fundamentals look very sound

for biofuel producers, there are several potential clouds on

the horizon. In August, Brazil's Chamber of Foreign Trade

announced a 20 percent import tariff on U.S. fuel ethanol,

a move that curbed exports by approximately 50 percent in

October before bouncing back in November and December.

In October, the U.S. Environmental Protection Agency

they released contained language indicating that the agency planned to evaluate a possible reduction in the 2018 and 2019 RFS requirements. Lower RFS mandates would negatively impact the profitability of biofuel, and it would likely lead to lower corn and soybean demand. Finally, the long-run trend of improving fuel economy for U.S. cars and

cases, the increase was driven by ethanol 6 4 2

Figure 14: Ethanol/Biodiesel Fuel Supply and Demand



BIOFUELS

(resource 29)

ANALYSTS CORNER: TAX CODE CHANGES AND WHAT THEY MEAN FOR THE FARM

(resource 30, 31, 32, 33)

50.000

Key Highlights Farmers will be affected by the same tax changes as everyone else

Section 199A could be a game changer (if it stands as written)

Tax analysts would be wise to pay attention to which changes are temporary and which are permanent

On December 22, 2017, President Trump signed into law the largest tax reform bill since the legislation enacting the Internal Revenue Code of 1986. The upcoming changes to the tax code are sweeping, affecting virtually every person and enterprise in the United States. The bill itself is 503 pages long, with another 560 pages of explanatory material offered by Congress. The sheer volume of material can be challenging to digest, and many of the provisions are certain to be the focus of interpretation by the courts and revision by Congress for years to come. However, no matter their background, most taxpayers will be asking the same question: "How does this affect me?"

Given the complex and interdependent nature of the tax code, along with the level of input detail required in many tax calculations, specialized software or personalized professional guidance is often required when preparing taxes. The large number of assumptions necessary for a precise estimate of tax obligation can limit the usefulness of the results from a generalized model to individual users. However, when looking at a specific industry such as



Source: Author's Calculations

farming, it's possible identify the changes that are likely to have the most significant impact, and approximate their directional effects and order of magnitude.

Most farms operate as pass-through entities, such as LLCs or partnerships. This means that income is not taxed at the organizational level, but instead passes through as income to the individual where it is taxed at an ordinary rate. Because of this, a significant portion of the tax bill's impact on farmers will be shared by other individual taxpayers. The most significant universal changes for individuals are: the modification of tax brackets, the increase in

the standard deduction, the removal of personal and dependent exemptions, and the increase of the child tax credit. Figure 15 shows a simple example of these changes for several taxpayers across a range of incomes.

As expected, tax savings are greater for those who can take advantage of the larger tax credits, as these have a dollar-fordollar impact on total tax liability. While this gives a useful look at the impact of a few major changes, it doesn't explain much about other large, more farm-specific overhauls and changes to commonly used itemized deductions.

Figure 15: Percent Change in Tax Obligation by AGI (Self-Employed, Married Filing Jointly, Standard Deduction)

The new tax bill includes generous new language in Section 199A, allowing deductions for qualified small business income and cooperative dividends. A deduction for small business income is allowed up to 20 percent of taxable income, which does not include capital gains income or qualified cooperative dividend income. A limitation to this deduction does exist, but is only phased in once qualified business income reaches \$315,000 for married taxpayers filing jointly and \$157,500 for individual filers.

Perhaps the most interesting aspect of this tax provision to farmers, however, is the 20 percent deduction available for qualified cooperative dividends. This applies to perunit retains paid in money (PURPIM) in addition to traditional patronage dividends paid by cooperatives. Because PURPIM reflects compensation for selling products to the cooperative, a farmer could use this provision to deduct up to 20 percent of gross sales, likely a much more lucrative move than deducting the 20 percent of net income when selling to other organizations. This creates a strong incentive to only sell to qualified cooperatives, putting other purchasers at an enormous disadvantage. This is pointed out in analyses of the new deduction, along with indications that it will likely come under more scrutiny in the coming months, with lawmakers looking to reduce unintended consequences. It will be important to stay alert to changes in this language before it comes time to file returns for 2018.

Other updates of interest to farmers are the increase of the Section 179 deduction limit from \$510,000 in 2017 to \$1 million, and the increase in bonus depreciation from 50 percent in 2017 to 100 percent for certain property. This bonus depreciation rate is then phased out over the next five years. These depreciation and expensing treatments can be extremely valuable, giving a farmer the ability to write off all or most of their tax bill in the year of a large purchase. However, as addressed in previous issues of The Feed, these deductions should not push a taxpayer to make poor investment decisions for the sole purpose of reducing their tax bill. Owners of large operations who have built substantial equity may benefit from adjustments to the estate tax. Under the new tax code, the threshold for exemption from this tax was raised from \$5 million to \$10 million, to be indexed for inflation. While this impacts a relatively small number of farms, it can have a large impact when it does apply. Subtler changes include the limitation of the state and local tax deduction to \$10,000 when married and filing jointly (\$5,000 for others) and the switch to Chained CPI for inflation indexing. It is important to remember that while many of the revisions to the tax code are set to expire in 2025, the change in inflation calculation is permanent. Chained CPI differs from the traditional CPI in that it allows modification to consumption based on prices. The important takeaway is that it increases at a slower pace than traditional CPI.

Tax brackets are indexed upwards over time to prevent drift into higher brackets due to inflation, rather than as a result of increased earning power. By switching to Chained CPI, tax brackets will not be quite as responsive to increases in the price level, and a relatively larger proportion of taxpayers may drift into higher, more expensive brackets over time.

Preparing taxes can be complex for many farm operations. While specific, personal guidance is recommended when calculating a tax obligation, it is beneficial to be aware of the primary changes introduced by the new tax code. Understanding new provisions and modifications, and how to maximize your benefit from them, can keep your farm competitive and positioned for success.

Figure	10:	Summary	OT	lax	Loae	Changes	In	2018	

Tax Code Change	Who Does This Affect Most?				
Tax Bracket Changes	Everyone, with the greatest proportional decreases in lower brackets and				
Tax Dracket Changes	the greatest dollar decreases in higher brackets.				
Standard Deduction	Those who do not itemize many expenses, or whose itemized expenses				
Increase	are not much higher than the previous standard deduction.				
Domoval of Examptions	Everyone, with the impact correlated directly with the number of				
Removal of Exemptions	exemptions you were previously able to claim.				
Child Tax Credit	Anyone with qualifying children, with the highest impact on a proportional				
Increase	and dollar basis for lower and middle brackets due to phaseouts.				
Section 199A	Any farmer operating as a small business, especially those selling to				
Deductions	cooperatives. Pay close attention for upcoming changes to this section.				
Section 179 and Bonus	Those who purchase and put into service a large amount of depreciable				
Depreciation Increase	machinery in a given year.				
Estate Tax Limit	Those who have built substantial equity in a large operation, in the event				
Increase	that they pass away.				
State and Local Tax	Those living in states with yony high tay rates				
Deduction Restriction	mose living in states with very high tax rates.				
Switch to Chained CPI	Everyone, although you may not notice the effects as they are happening.				

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ABOUT THE AUTHORS



Co-Author - Jackson Takach, Farmer Mac's Director of Economic & Financial Research, 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 at Farmer Mac currently 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 CFA Charterholder since 2012.



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