CARD Agricultural Policy Review
IOWA STATE UNIVERSITY OF SCIENCE AND TECHNOLOGY
Ames, Iowa • Fall 2016

Succession Planning, Perceived Obstacles, and Attractions for Future Generations Entering Beef Cattle Production

By Lee Schulz, Georgeanne Artz, and Patrick Gunn
lschulz@iastate.edu; gartz@iastate.edu; pgunn@iastate.edu

GIVEN THE current demographics of beef cattle producers in the United States, a significant turnover of productive assets will likely occur in the industry over the next decade. The 2012 Census of Agriculture reported that 35 percent of US beef cattle and ranching and 28 percent of US cattle feedlot principal operators are over the age of 64 (USDA NASS 2014). An additional 27 percent of beef cattle and ranching principal operators and 28 percent of cattle feedlot principal operators are between 55 and 64 years of age (USDA NASS 2014). Yet, according to the 2015 Iowa Farm and Rural Life Poll, among farmers who plan to retire in the next five years, only 55 percent have identified a potential successor (Arbuckle and Baker 2015).

Ensuring the transfer of economically viable farms to the next generation has implications for the future size and structure of the industry as well as for the rural economies that depend on agriculture.

Larger, more profitable farms are more likely to have a successor in place (Kimhi and Nachlieli 2001), while operators of smaller farms lacking a successor are more likely to begin a process of disinvestment in their property once they near retirement in their late-50s (Mishra, Wilson, and Williams 2009). Over time, this pattern results in fewer, larger, and more capital-intensive operations, creating a barrier to entry for beginning producers who do not inherit an existing farm.

Policymakers have responded to the need to facilitate farm succession by providing targeted programs, particularly for beginning farmers; however, information is needed on the obstacles and attractions perceived by the older generation of producers who are nearing retirement to target succession programs more effectively.

A mail survey was designed to obtain information from Iowa cow-calf producers and feedlot operators. The comprehensive survey included questions regarding various aspects of cattle production, including demographics and current production and marketing practices as well as questions regarding succession planning and what existing producers saw as the greatest obstacles and attractions for the state's cattle sector. Interested readers may find the full set of survey questions and responses in Schulz (2014a,b).

Inside this issue

Succession Planning, Perceived Obstacles, and Attractions for Future Generations Entering Beef Cattle Production 1
Fuel Price Impacts of the Renewable Fuel Standard 3
Forward Contracting by Iowa Corn Producers: Connecting Hedging with Price Movements 5
Of Maize and Markets: China's New Corn Policy 7
For Ag, It's Mostly Good News on the Demand Front 10

The *Agricultural Policy Review* is primarily an online publication. This printed copy is produced in limited numbers as a convenience only. For more information please visit the *Agricultural Policy Review* website at: *www.card.iastate.edu/ag_policy_review.*

For the questions used in this analysis, 215 cow-calf producer and 185 feedlot operator usable surveys were available.

Similar to the average age of US cattle producers, producers responding to the survey were on average in their late-50s. Roughly 90 percent of producers have more than 20 years of experience in raising beef cattle. Not surprisingly, given the average age of producers, 49 percent of cow-calf operators and 52 percent of feedlot operators expect to exit beef cattle production within the next 10 years.

Across both cow-calf producers and feedlot operators approximately 50 percent expect to be raising cattle for 10 more years or less (Table 1). However, a significant number of producers with relatively short time horizons do not have a succession plan. Thirty-eight percent of the cow-calf producers and 39 percent of the feedlot operators who expect to be raising cattle for 10 years or less do not have a succession plan in place.

Twenty-nine percent of cow-calf producers and 44 percent of feedlot producers have encouraged an heir to take over the cattle operation but are willing to work with a non-family member if an heir is not present or interested in entering cattle production (Table 2). On the other hand, 33 percent of cow-calf producers and 28 percent of feedlot operators have encouraged an heir but are not willing to work with a non-family member. Twenty-seven percent of cow-calf producers and 18 percent of feedlot operators have not encouraged an heir and are not willing to work with a non-family member. Only about 10 percent of both cow-calf and feedlot owners have not encouraged an heir but are willing to work with a non-family member.

Among producers that do not have a succession plan, feedlot operators consider work hours as well as labor availability and costs to be more of an

Table 1. Succession Planning by Expected Years to be Raising Cattle[1]

Expect to raise cattle:	Cow-calf				Feedlot			
	≤10 years		>10 years		≤10 years		>10 years	
	49% (n = 104)		51% (n = 110)		52% (n = 96)		48% (n = 89)	
Type of Succession Plan:	N	%	N	%	N	%	N	%
Transfer to next generation or secondary operator	42	40	36	33	55	57	42	47
Transfer to outside established or beginning producer	7	7	0	0	0	0	2	2
Sell cattle and use land for other purposes	16	15	3	3	4	4	4	4
No Plan	39	38	70	64	37	39	41	47
Total	104	100	110	100	96	100	89	100

Note: One cow-calf respondent was not included in this analysis because they responded "Other" without further explanation to the question, "Is there a succession plan for transferring your cattle operation upon exiting the industry?"

[1]Frequencies calculated using weights that adjust sample characteristics to match NASS cow-calf and feedlot operation numbers. Frequencies rounded to the nearest whole number.

Table 2. Producers' Encouragement of an Heir and Willingness to Work with a Non-Family Member to take over Ownership of the Cattle Operation[1]

		If you have an heir (e.g., son, daughter, grandchild, in-law, other relative) to take over the cattle operation, are you encouraging them to do so?			
		Yes		No	
Would you be willing to work with a non-family member if an heir is not present or interested in entering cattle production?	**Yes**	Cow-calf 29%	Feedlot 44%	Cow-calf 11%	Feedlot 10%
	No	Cow-calf 33%	Feedlot 28%	Cow-calf 27%	Feedlot 18%

[1]Frequencies calculated using weights that adjust sample characteristics to match NASS cow-calf and feedlot operation numbers. Frequencies rounded to the nearest whole number.

continued on page 12

Fuel Price Impacts of the Renewable Fuel Standard

Gabriel Lade and James Bushnell
gelade@iastate.edu; jbbushnell@ucdavis.edu

GASOLINE PRICES are the lowest they've been in a decade, and according to recent data from the Department of Energy, Americans are buying more gas than ever. While low gas prices are good for consumers, they may be troublesome to those who worry about greenhouse gas emissions. Meanwhile, two important federal policies are pushing ahead to decrease transportation sector emissions by increasing vehicle efficiency and the use of renewable fuels: the federal Corporate Average Fuel Economy standards and the US Renewable Fuel Standard (RFS). Both policies have substantial impacts on consumers' vehicle and fuel choices as well as on their fuel spending.

The Renewable Fuel Standard and RIN Markets

The RFS was passed in 2007 and established aggressive biofuel mandates—25 percent by 2022. The policy is a market-based regulation. Rather than requiring refineries to get into the biofuel business, the Environmental Protection Agency (EPA) created an accounting system where every gallon of biofuel produced in or imported into the United States generates a credit, known as a RIN. To comply with the RFS, refiners must turn in their required amount of RINs to the EPA at the end of each year. How they obtain those RINs is up to them. Petroleum refiners can buy RINS from independent biofuel producers, or get into the biofuel business and produce RINs themselves. Importantly, the price of RINs is set by market forces. The RFS determines the demand for RINs by specifying how much biofuel, and therefore how many RINs, need to be sold in aggregate each year. Biofuel producers determine the supply. As demand for RINs or the cost of producing biofuel increases, the price of RINs will increase and vice versa.

Several individuals in the popular press, as well as refiners and large investors in oil companies, have called the viability of the RIN market into question recently. Criticisms come primarily in two forms: (*a*) the market lacks transparency and is subject to manipulation by speculators; and (*b*) refiners are getting unduly squeezed by RIN costs. Except for known fake RIN generation in the biodiesel market several years ago, there is little concrete evidence to support the first claim. Many markets operate outside of formal exchanges, and recent work by Lade, Lin-Lawell, and Smith (2016) finds that RIN markets are efficient. The second claim ignores the economic principle of cost pass-through—when refiners' costs go up, either because of increased oil prices or higher taxes, they pass a portion or all of the increased costs to downstream users.

Impacts of the RFS on Consumers and Fuel Prices

The RFS doesn't just affect refineries and biofuel producers. The policy needs consumers to purchase more biofuels to succeed. For most consumers, this has meant switching from using pure gasoline to using E10—gasoline containing 10 percent ethanol. In fact, nearly all gasoline sold in the United States today contains 10 percent ethanol (EIA 2016). Still, in 2007 Congress envisioned an even greater amount of biofuel use. This means that consumers must start using higher blends of ethanol such as E15 and E85 to reach the targets set in 2007.

RINs directly impact the relative cost of ethanol and gasoline. They subsidize biofuels and increase the cost of selling gasoline and diesel. These effects are reflected in the price that regional fuel terminals pay for fuel, and therefore affect prices paid by consumers at the pump. How large these price effects are depends on the pass-through of RINs and the ethanol-gasoline blend of fuels.

Fuel market supply and demand conditions determine pass-through. Because fuel demand is inelastic (people's driving habits do not change much in response to gas prices), we expect taxes and subsidies on upstream producers to be passed through to retail prices. This means that as RIN prices

increase, gasoline will become more expensive and ethanol will become cheaper. What some critics of the RFS essentially argue is that this is not happening due to some market failure.

To examine this issue, we study RIN pass-through in a market where we most expect to detect it: the market for E85. E85 contains between 51 and 83 percent ethanol, and therefore the value of the RIN subsidy for ethanol is high relative to the RIN tax on gasoline. Thus, when RIN prices rise, we expect E85 to become cheaper. Examining prices from over 450 stations in the Midwest, we find that the net subsidy for E85 is mostly passed through to retail prices.

Figure 1 illustrates this point for our stations in Iowa. In Figure 1(a), we graph the average retail E85 price along with our estimates of the wholesale ethanol and gasoline cost components of E85 from 2013–2016. After accounting for state and federal retail fuel taxes, we find that wholesale E85 fuel costs largely exceeded retail prices over the period. Only when we allow for pass-through of RINs by adjusting the wholesale fuel costs can we rationalize historical retail E85 prices. When we adjust the wholesale costs by the RIN subsidy and tax in Figure 1(b), our estimated average retail margins are $0.29/gal, in line with estimates of retail margins for other fuels.

Overall, our findings mean that as RIN prices rise, refiners and biofuel producers pass along their additional costs and savings onto consumers, respectively. What does this mean for US consumers in coming years? This depends on how aggressively the EPA pushes the biofuel mandates. The agency has slowed the pace of the mandates since 2013 from the original schedule passed by Congress. However, if the EPA continues to push the mandates beyond 10 percent, consumers will likely see prices of higher blend ethanol fuels like E15 and E85 fall.

The United States government wants you to use more ethanol, but it certainly doesn't expect you to do so out of the kindness of your heart—that is the beauty of market-based mechanisms. Prices will adjust, a potential boon for consumers filling up with greater than E10 blends. Just make sure you have the right vehicle—not all vehicles are capable of using more than 10 percent ethanol. ■

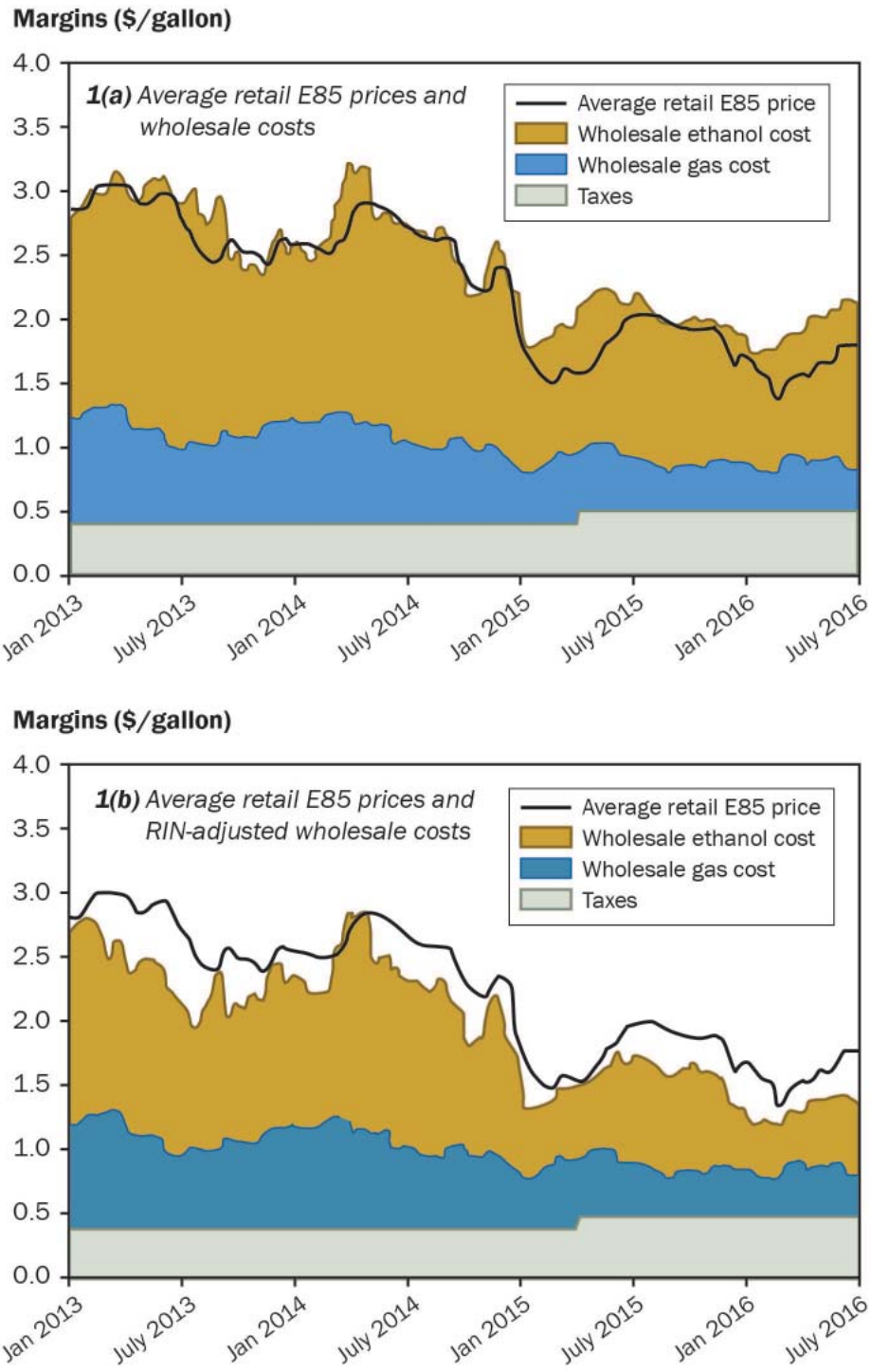


Figure 1. E85 pass-through—retail E85 prices and wholesale fuel costs in Iowa.

References

Energy Information Agency (EIA). 2016. "Almost all U.S. Gasoline is Blended with 10% Ethanol." *Energy Information Agency: Today in Energy*, May 4, 2016.

Lade, G.E., C.-Y.C. Lin Lawell, and A. Smith. 2016. "Policy Shocks and Market-Based Regulations: Evidence from the Renewable Fuel Standard." Working Paper 16-WP 565. Center for Agricultural and Rural Development, Iowa State University.

Forward Contracting by Iowa Corn Producers: Connecting Hedging with Price Movements

by Keri L. Jacobs, Ziran B. Li, and Dermot J. Hayes
kljacobs@iastate.edu; ziranl@iastate.edu; dhayes@iastate.edu

IN 2015, Iowa corn producers marketed approximately 2.5 billion bushels of corn and 554 million bushels of soybeans (USDA 2016). As part of their marketing strategy, some crop producers make use of pre-harvest pricing tools such as forward contracting and hedging with futures contracts. These are tools intended to either enhance the price producers can receive for their product or mitigate some risks associated with uncertain prices. Forward contracting allows a producer to fully or partially price his crop for delivery to a processor or elevator at a later date. Hedging on futures is similar to forward contracting in that the producer is pre-pricing his crop by taking a short position in a commodity contract with a delivery date in the future. Unlike forward contracting, hedges can be removed if price conditions change, but even with the hedge in place, basis remains an important risk component faced by the producer. In both cases, uncertainty about the size of his crop limits a producer from fully pre-pricing his harvest.

Agricultural economists and extension specialists who work with producers and analyze marketing practices are interested in understanding the factors that play a role in producers' forward contracting or hedging behaviors. How prevalent is the use of forward contracting among producers? Is pre-pricing driven by price or price changes? Which prices seem to matter most?

A study at ISU in collaboration with a prominent grain marketing cooperative in Iowa investigates the relationship between producers' forward contracting behaviors and the December futures contract price movements of corn in the pre-harvest period of January through August.[1] A database of over 115,000 individual priced-forward contracts for corn made from January through August for the years 2009–2013 were analyzed, focusing specifically on contracts for delivery between September 1 of that year and August 31 of the following year. The study data included information on the number of bushels contracted each day and also the cooperative's total purchases of corn in each year. The co-op's weekly aggregate hedge ratio was constructed and analyzed for its response to changes in the December futures contract price as well as other candidate reference prices that could trigger producers' hedging.[2]

Table 1 summarizes the aggregate observed forward contracting activity of producers in each of the marketing years by month. The data show that producers do indeed hedge more of their crop in some years and in other years only a small fraction of the expected harvest, and this is consistent with anecdotal evidence from grain merchandisers. Generally speaking, 2011 and 2012 were relatively high-price years, with average December futures contract prices in the pre-harvest period at $6.42 and $6.09, respectively. In those years, and in 2010, a year of rapidly raising corn prices, over 20 percent of the crop was forward contracted by August with some form of price protection (basis or futures price). In contrast, less than 4 percent of the crop was priced by August of 2013, a year when corn prices fell significantly but still averaged over $5.38 per bushel; however, approximately 13 percent was forward contracted in 2009 when the average December price was just $4.02 per bushel.

Regardless of the harvest price level observed by producers, they increased forward contracting for

Table 1. Aggregate Producer Hedge Ratio of Expected Crop by Marketing Month and Year

	Crop Growing Year				
	2009	2010	2011	2012	2013
January	0.5%	1.5%	2.8%	0.7%	0.3%
February	0.9%	2.0%	4.8%	1.8%	0.5%
March	1.7%	2.7%	6.5%	3.4%	1.4%
April	2.5%	5.0%	9.9%	4.2%	1.8%
May	8.9%	6.6%	12.0%	5.0%	3.0%
June	11.6%	7.2%	13.7%	13.0%	3.3%
July	12.0%	14.7%	16.9%	20.3%	3.5%
August	12.9%	24.1%	21.3%	23.3%	3.8%

[1]Basis movements for delivery in October, November, and December for contracts initiated in the period January through August are not considered.

[2]The producers' hedge ratios are calculated by dividing the total amount of corn forward contracted (in bushels) by producers at any given time by the cooperative's total annual handle of corn in that year.

future delivery as prices rallied and reduced it when prices fell. Under a standard expected utility framework, producers using forward or futures contracts to reduce commodity price risk should behave opposite this to limit the downside risk.

Finally, there are asymmetries in these producers' forward contracting that can be explained by price movements relative to reference prices. Producers forward contract a greater proportion of their crop when prices are above some historic reference price and they significantly limit selling when the price is below this reference. Controlling for time to harvest, expected production, and price volatility, a one percentage point increase in the 30-day average price of the December futures contract is associated with a 0.14 percentage point increase in forward contracting; however, a one percentage point decrease in the same price causes a 0.12 percentage point reduction in forward contracting. The hedge and price series are plotted in Figure 1.

Does The Producers' Strategy Result in a Higher Price of Marketed Grain?

That producers' forward contracting activities appear to respond to price changes suggests that marketing may be less about risk management and more about an attempt to time the market to achieve a certain price target or minimum threshold. Using the known December contract prices and the actual contract data for each year, weighted average prices per bushel were calculated under several marketing scenarios. Table 2 summarizes the weighted average per bushel prices for these scenarios. In hindsight, no one strategy was best across all years. Also, the actual forward contracting behavior observed was not the worst case in any year, and on average, the contracting resulted in an average price only slightly below the strategy that resulted in the highest five-year average price: pricing it all at harvest.

The bottom line is that it appears producers are using forward contracting to time the market, and this strategy potentially increases the marketing risk they face. In years of good growing conditions and potentially large crops, they hedge a very low proportion of their crop. Yet, these are precisely the years when forward contracting a growing crop makes most economic sense. ■

References

Jacobs, K.L, Z.B. Li, and D.J. Hayes. 2016. "Price Responses in Forward Contracting: Do We Limit the Upside and Expose the Downside?" AgEcon Search: http://ageconsearch.umn.edu/bitstream/235539/1/AAEA%202016%20selected%20paper.pdf

United States Department of Agriculture National Agricultural Statistics Service (USDA). 2016. "Crop Production 2015 Summary, January 2016."

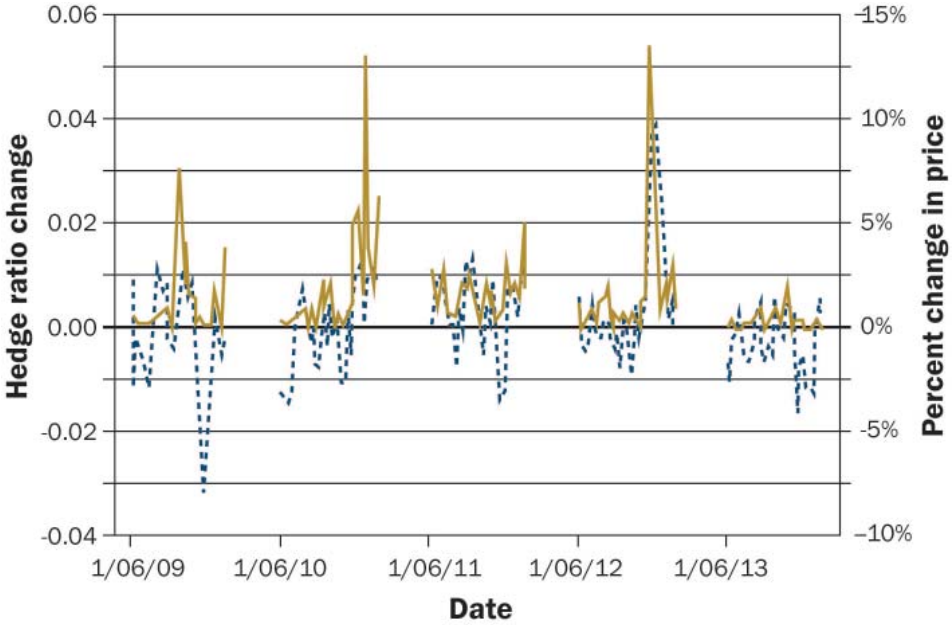


Figure 1. Weekly change in producer hedge ratios vs. percent price changes for December futures from its past 30-day moving average in the pre-harvest period, 01/2009–08/2013.

Table 2. Average Marketing Prices by Forward Contracting Strategy

Marketing Strategy	Average Marketing Price Outcomes					
	2009	2010	2011	2012	2013	5-year Avg
Sell equal amounts monthly	$4.02	$3.95	$6.42	$6.09	$5.38	$5.17
Price at harvest	$3.71	$5.46	$6.32	$7.50	$4.39	$5.48
Price in January	$4.35	$4.13	$5.69	$5.67	$5.85	$5.14
Price in March	$4.11	$3.97	$5.98	$5.59	$5.58	$5.05
Actual contracting by producers	$4.15	$4.00	$6.57	$6.80	$5.49	$5.40

Of Maize and Markets: China's New Corn Policy

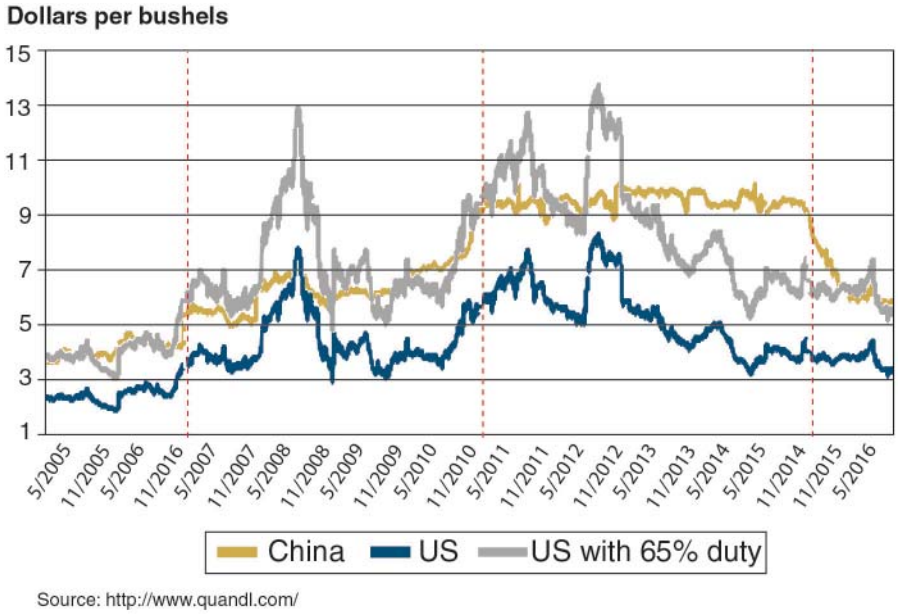
by Qianrong Wu and Wendong Zhang
qianrong@iastate.edu; wdzhang@iastate.edu

IN EARLY 2013, farmers in Iowa and across the Midwest braced for a difficult corn market, with prices declining from $7/bushel in late 2012 to $4/bushel in early 2015, and finally settling at $3/bushel. Shielded from the world market, corn producers in China enjoyed a steady elevated corn price of almost $10/bushel from 2011 until 2015—largely a result of China's obscure price floor corn policy. While China's corn production is mainly used for domestic consumption, policy changes in China's corn markets have trade implications for the global corn, beef, and pork sectors. For example, last month, the United States filed a complaint with the World Trade Organization over China's excessive subsidies to corn, rice, and wheat farmers (OUSTR 2016). In this article, we examine why China has ended its nine-year-old corn price support policy, and implemented new corn policies.

China's Costly Corn Support Price Program 2007–2016

Corn, wheat, rice, and soybeans are major crops in China, and Chinese farmers have been paying agricultural taxes to grow these crops for almost two thousand years. In 2004, China switched from taxing corn farmers to providing subsidies for seed and machine purchases. To further boost rural income and ensure national food security, China started a nationwide corn stockpiling program in 2007. A key feature of this policy is that the government collects corn from farmers at minimum support prices, which are typically substantially higher than market prices. This significantly distorts the market—artificially elevated support prices have enticed farmers to grow corn and sell to the state storage facilities, while rising labor cost due to the increased rural income from this support policy have kept corn prices high. Figure 1 shows historical corn future prices in China and the United States—clearly revealing that from 2007 to 2016 China's policy drove corn prices up to two or three times that of US corn prices. Interestingly, it seems that China's support price program has gone through two phases: (*a*) from 2007 to 2010, the target support price for corn tracked closely to the corn import price plus a 65 percent out-of-quota duty; and (*b*) in 2011, China unveiled a fixed and extremely costly support price policy that kept futures prices between $9–$10/bushel for almost five years.

High corn prices created incentive for Chinese farmers to produce more corn (see Figure 2). Farmers planted corn in grasslands, deserts, on mountainsides, and in marshes under the high corn price, increasing total acres to 95 million—a 26 percent increase from 2006 to 2015 (Li 2016). In 2012, corn exceeded rice in production to become China's largest grain crop (SCD 2015). The corn support policy also led to a drop in domestic corn consumption as well as a substantial increase in the import of corn substitutes. This is due to the high domestic corn price and a spatial mismatch between where corn is grown and where it is used. As Figure 3 shows, major corn production occurs in northern China, while the corn demand, proxied by leading pork production regions, is mainly located in the south. Corn in China is mainly used for feed, and transportation costs from the production to consumption areas makes imported feed a cheaper alternative (Iowa Farm Bureau 2014). Corn end-users in China (e.g., feed processing plants, livestock producers, bio-refineries) need to tradeoff between domestic corn and imported corn. On the one hand, corn produced in northeastern China has a steep



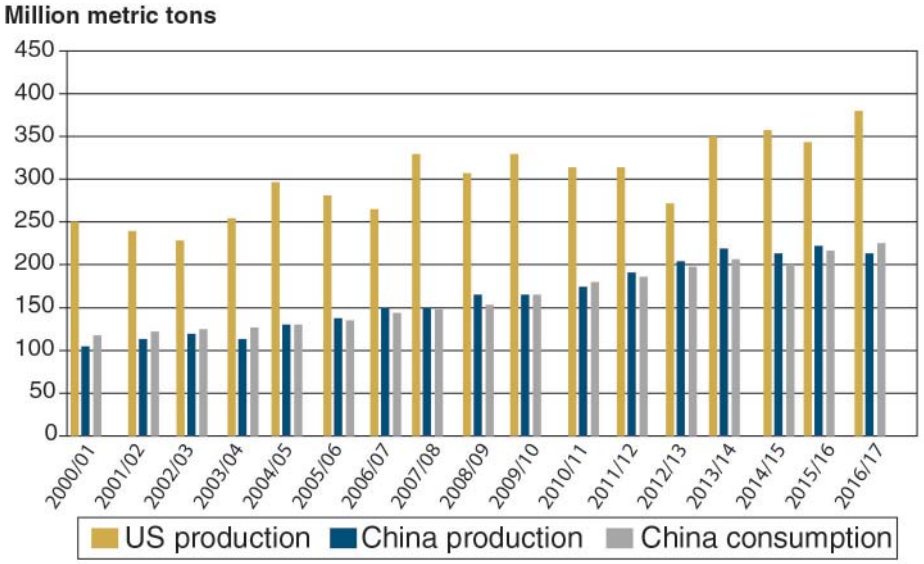
Source: http://www.quandl.com/

Figure 1. China and US corn future prices 2005–2016

support price plus a roughly 15 percent transportation cost; on the other hand, imported corn has a 65 percent out-of-quota duty for imports beyond the quota, plus barging costs and a $20/ton ocean transport fee. The gray line in Figure 1 presents the 65 percent out-of-quota duty upon imported US No. 2 corn prices, revealing that Chinese corn was still too expensive from 2013 to 2015. As a result, massive amounts of corn and corn substitutes (sorghum, barley, DDGS, cassava chips, and cassava starch) were imported by China. In particular, Figure 4 reveals China's imports of corn, sorghum, and barley have more than quadrupled from 2011 to 2015 compared to low steady levels from 2005 to 2006. This is likely driven by the dramatic policy shift to a steep support price of $9–$10/bushel in 2011 (as shown in Figure 1).

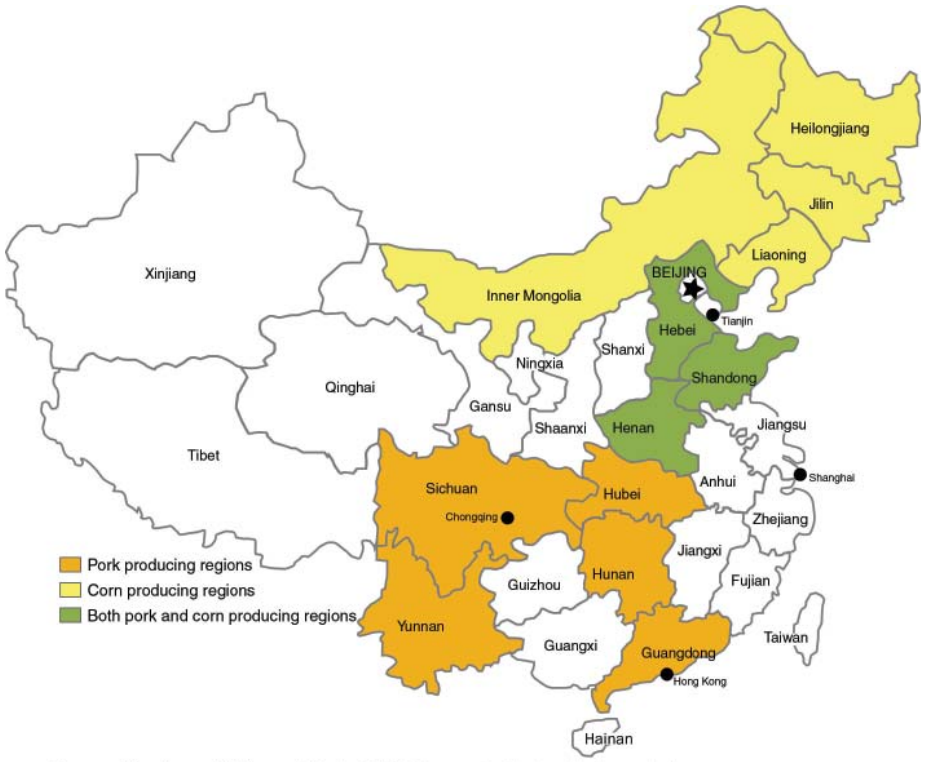
As Figure 5 shows, China's escalating corn storage is a noticeable outcome of the price support policy—China and the United States had roughly the same ending stocks in 2006/07, but in 2015/16, China's were almost double the US supply. Increased storage was the intention of the Chinese government, but is more a result of excessive production, import demand triggered by the support price policy, and a lack of domestic demand. In fact, warehouses in northeastern China currently have no room to store grain. More interestingly, corn storage accumulated faster after China unveiled the $9–$10/bushel fixed support prices in early 2011. By the end of 2015, China had stored enough corn for at least six months of domestic consumption. In contrast, the global average storage-to-consumption ratio is roughly 20 percent.

The stockpiling and support price policy has a steep price tag for China—the government faces significant financial burden due to high procurement prices. USDA estimated this policy has cost China more than $10 billion (Ballard 2016). The



Source: USDA FAS Grain: world markets and trade

Figure 2. Corn production and consumption in China and the US 2000–2016



Sources: https://www.statista.com/statistics/242632/corn-production-in-china-by-region/
http://chinaag.org/services/production/

Figure 3. Major corn and pork production provinces in China

price support policy also took a toll on China's aging storage facilities. In addition to corn degradation caused by structural deficiencies of warehouses, problems like mismanagement were commonplace; in fact, Chinese state television reported officials profited from selling inferior grains at new grain prices, dubbing them "rats in warehouses" (Hornby 2015). Some industry analysts estimate that over 20 MMT of corn reserves are so moldy or deteriorated that they are no longer suitable for human consumption or feed use (Gale, Jewison, and Hansen 2014). Due to the huge financial and storage burden, this stockpiling program was

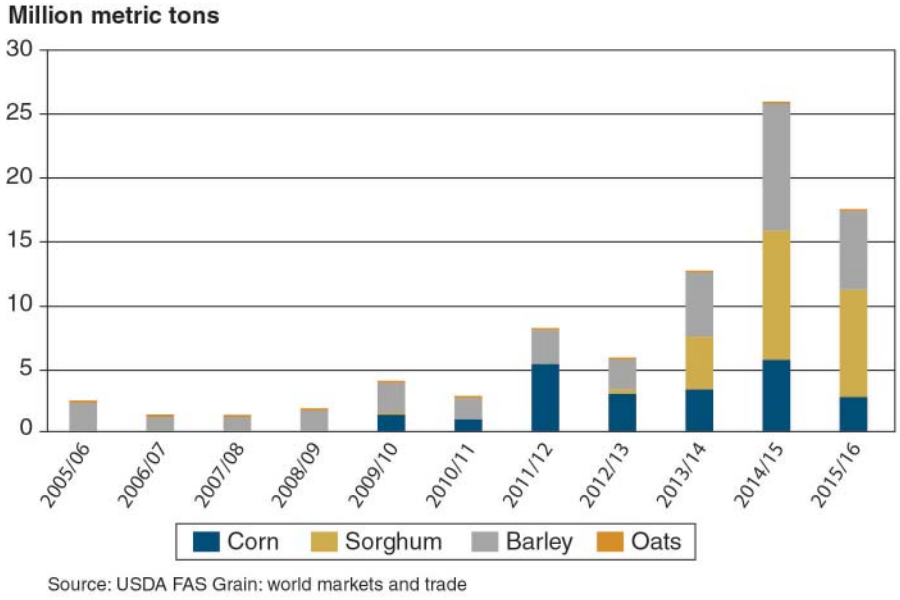


Figure 4. China corn, sorghum, barley, and oat imports 2005–2016

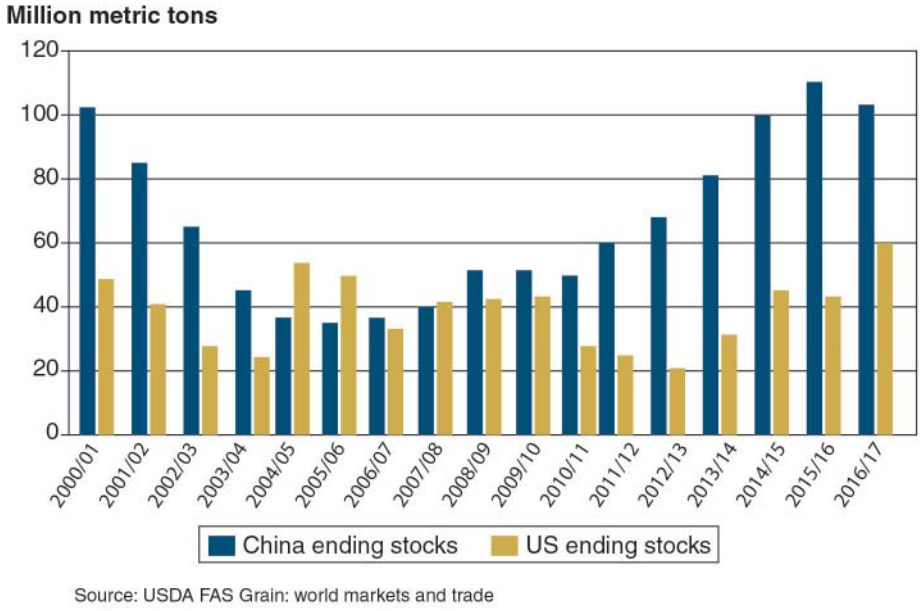


Figure 5. China and US corn ending stocks 2000–2016

discontinued by the Chinese government in March 2016.

China's New Corn Subsidy Program

To replace the state stockpiling program and support price policy, China adopted a direct payment corn subsidy policy tied to planting acres in spring 2016—a policy familiar to US farmers. China's Ministry of Finance will allocate a 30-billion-yuan corn subsidy ($4.51 billion) to farmers in four provinces in northeastern China, which boasts more than 60 percent of China's corn production (Patton and Hogue 2016), in the 2016/17 crop year. The payment in each county will vary depending on the ratio of funds to area planted in corn, ranging from US $109–$163 per acre with an average of 150 yuan per mu ($137 per acre) (Dim Sums 2016b,c).

China is now also employing multiple measures to cut corn production and storage. First, the Chinese government just permitted state-owned companies to export about 2 million metric tons of corn to neighboring countries including Central Asia (Dim Sums 2016a). Second, China's Ministry of Agriculture is forecasting a 5-million-acre reduction in corn in 2016 due to the dramatically lower corn price, especially in fringe production areas out of the four northeast provinces (MAPRC 2015). Corn acreage is projected to drop from 93 million acres to around 86 million acres in 2018–2020 (Dim Sums 2015), and converted corn acreage is projected to soybean, other coarse grains, and fodder crops. Third, companies and interest groups have been lobbying the Chinese government to subsidize the use of stored corn for biofuel production.

Implications for US Agriculture

China is the largest and third-largest importer of US soybean and pork, respectively; therefore, it is critically important to assess China's corn policy and its impacts on US agriculture. In the short run, it seems China will embrace a direct payment corn subsidy program, similar to what the United States adopted about two decades ago. As a measure to decrease stored corn, China is offering corn exports at lower prices than the United States and Brazil, which could potentially put a downward pressure on the global corn market. However, the poor quality of stored corn might hinder China's role in the global corn export market. In the meantime, China's imports of corn substitutes might decrease in order to encourage domestic consumption.

In the medium and long run, China is downplaying the strategic role of corn, and only regarding wheat and rice as its two main food crops, which may suggest the possibility

continued on page 14

For Ag, It's Mostly Good News on the Demand Front

By Lee Schulz and Chad Hart
lschulz@iastate.edu; chart@iastate.edu

THE CROP and livestock markets have experienced significant swings over the past few years—record crop prices in 2012 and 2013 were followed by record livestock prices in 2014. Since then, prices have tumbled across the board. In most cases, price reductions have been driven by increases in supply, as opposed to drops in demand.

For the hog sector, the last five years have been very good from a packer demand perspective. As Figure 1 shows, packer demand for hogs surged in 2012 and has basically ridden that wave ever since, with only a slight setback in 2015. The downturn in 2015 occurred when hog prices dropped from record levels. Pork exports have been strong since 2011, supporting packer demand; and the near-term future looks positive as well, as the pork industry will add slaughter capacity over the next couple of years. The growth in packer demand for 2016 is a combination of larger pork supplies and higher real prices than a year ago.

Domestic demand for pork, measured at the retail grocery counter, has also strengthened over the past five years, despite the volatility in the hog market. Figure 2 displays the retail demand for pork. Domestic pork demand has not been this strong since 2004; however, the growth in pork demand has slowed over the last couple of years.

For the cattle sector, the packer demand over the past few years has been more variable, as can be seen in Figure 3. In general, packer demand has trended downward since 2011; however, there has been a couple of waves of demand growth, in 2013 and 2015. Packer demand in 2016 took the largest step back since 2009. While the amount of beef moving through packers has increased, the price decline more than offset the gain. Cattle prices during the 2nd quarter of 2016 were down nearly 14 percent from the previous quarter.

While packer demand for cattle has declined, retail demand for beef has trended higher, peaking as recently as 2015. Figure 4 shows retail demand for beef. While beef demand has slowed a bit, the 2nd quarter numbers show demand holding at the second-highest level since 2000. Compared to a year ago, beef consumption is higher and retail prices are lower; however, the decline in prices is bigger than the increase in consumption.

The mostly positive demand story for the livestock industries has also contributed to a stronger demand and usage story for the crop sector as well. Figure 5 shows the quarterly usage of US corn over the past five marketing years. The marketing year for both corn and soybeans begins on September 1 of the year when the crop was harvested. So, for example in the corn and soybean figures, "2011 Q1" refers to the 1st quarter of the 2011 marketing year, or September to November 2011. The 2nd quarter covers December to February, the 3rd quarter March to May, and the 4th quarter June to August. As Figures 5 and 6 show, livestock feed usage peaks during the 1st quarter of the marketing year. While that 1st quarter peak has not been quite as high over the past couple of years, the usage in the other quarters has provided support. On average over the five-year period, feed usage has increased by 11 million bushels per year.

The ethanol industry's usage of corn has grown significantly over the past couple of decades, such that it now

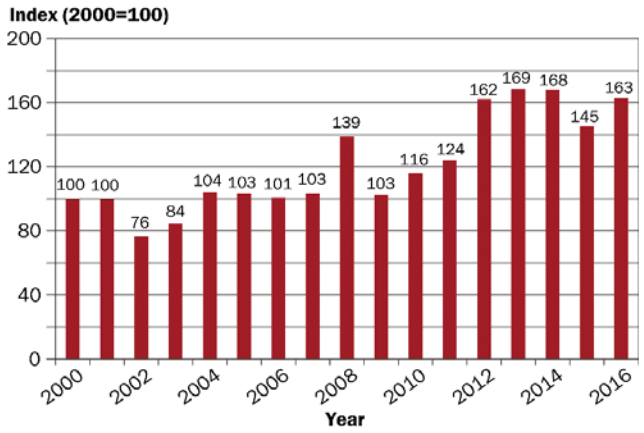


Figure 1. Second quarter (Apr-Jun) US packer demand for hogs index

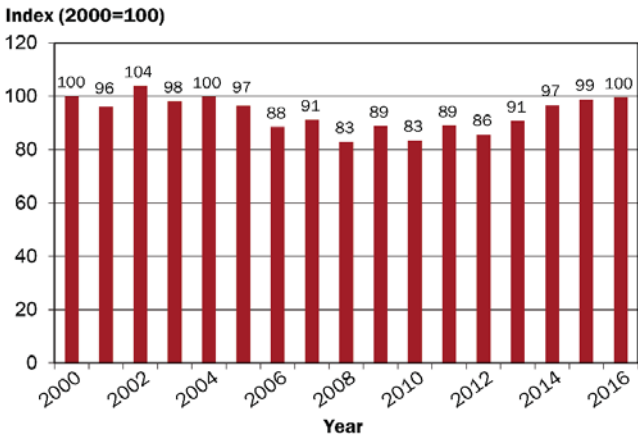


Figure 2. Second quarter (Apr-Jun) US retail pork demand

challenges feed as the largest usage category. While corn usage for ethanol declined in the 2012 marketing year, the general pattern has been slow and steady growth. From 2011 to 2015, corn usage for ethanol grew by 24 million bushels per year; however, the strongest annual growth rate for corn usage over the past five years has been in exports. The international market for corn has been absorbing, on average, an additional 39 million bushels per year. Much of the export gain has come from the Latin and South American countries, as the provisions of free trade agreements are enacted. Corn usage in other categories (corn sweeteners, industrial uses, etc.) has remained flat over the same period.

There has been similar growth in the components of soybean usage. Figure 6 outlines the usage of soybeans over the past five marketing years. Roughly half of the US soybean crop goes to international markets and the other half is used domestically. Like corn, soybean usage is loaded toward the front end of the marketing year. For domestic use, this is due to the need to crush soybeans to create soybean meal, a livestock feed product. Soybean oil is also created, which is often used for biodiesel production or other industrial processes. Both of these products can also be exported. The average growth rate for domestic soybean usage has been a 7 million bushel increase per year over the past five years.

Most of the growth for soybean demand over the past few years has come from exports. The Chinese market continues to expand its need for soybeans and that has driven US soybean exports to a steady stream of records. The projections for the 2016 marketing year continue that string. On average, soybean exports have grown by 20 million bushels per year. Given USDA's latest projections, this year soybean exports will rise by 45 million bushels.

Overall, the demand picture for crops and livestock is good. The issues the markets are having are more related to large supplies than declines in demand. For the livestock sector, the growth in supplies is slowing; however, the crop sector has not been able to pull back on production. In both sectors, prices will remain under pressure given the larger supplies. ■

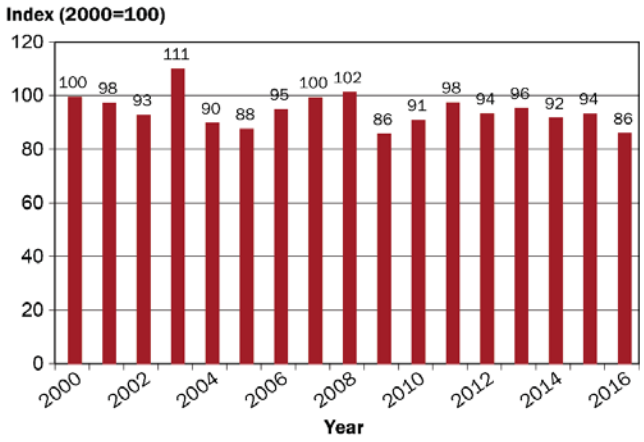


Figure 3. Second quarter (Apr-Jun) US packer demand for cattle index

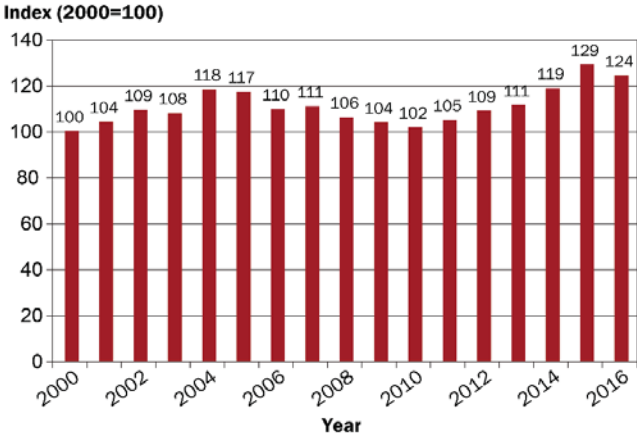


Figure 4. Second quarter (Apr-Jun) US retail all fresh beef demand

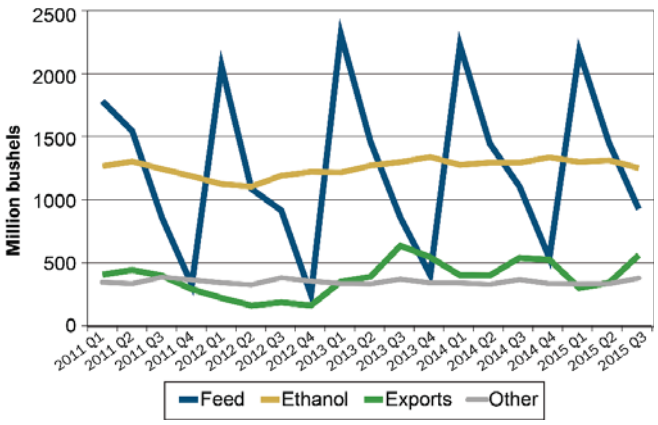


Figure 5. Quarterly usage of US corn 2011-2015

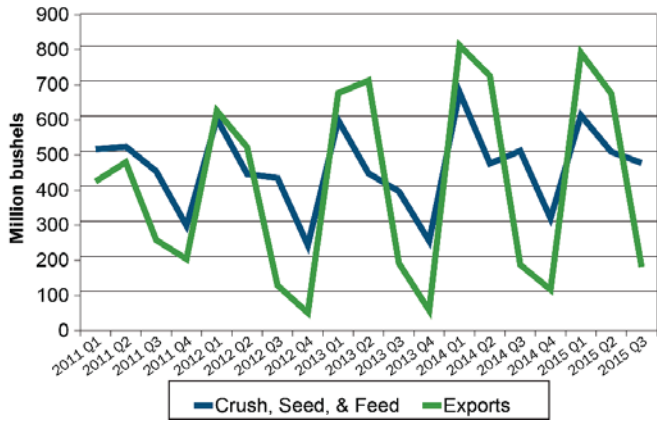


Figure 6. Quarterly usage of US soybeans 2011-2015

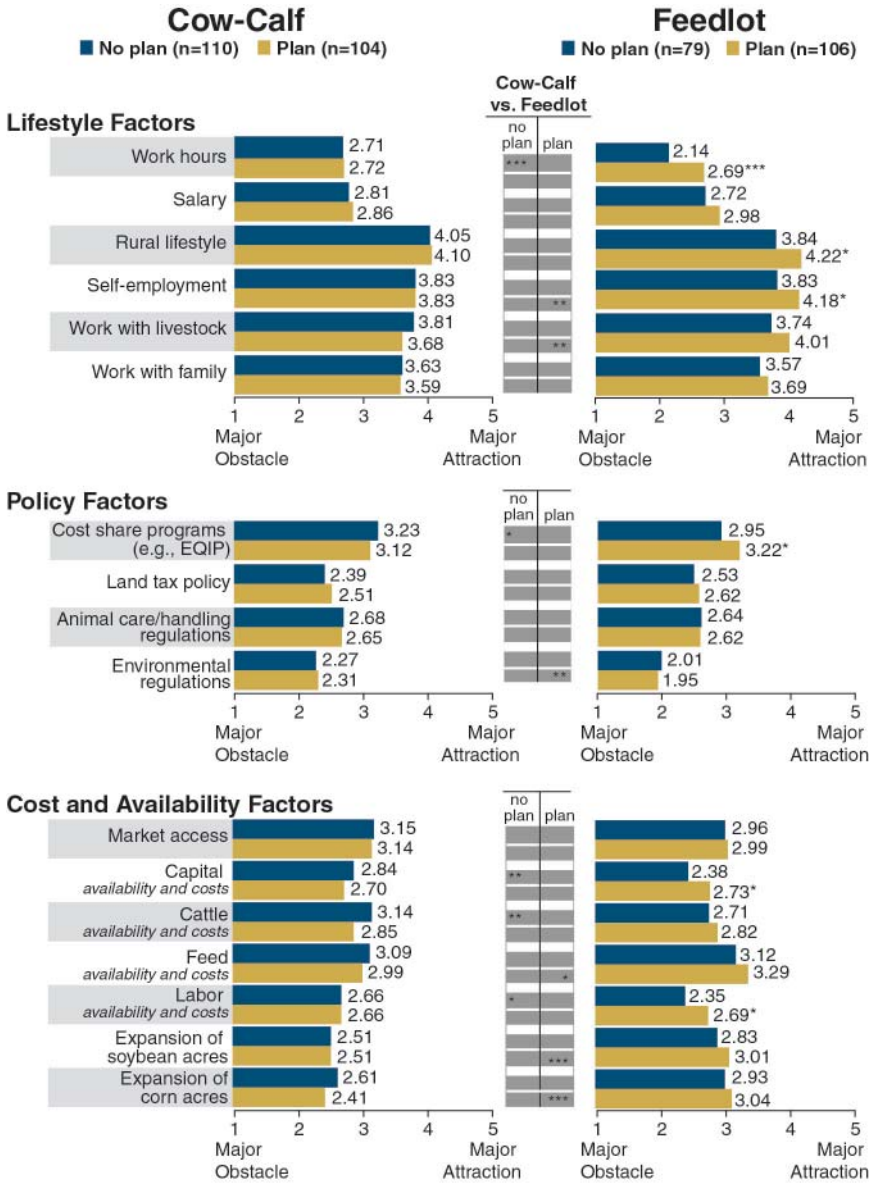
continued from page 2

obstacle than do cow-calf producers. This is not surprising given the amount of hired labor differences between these two sectors. In 2015, a survey conducted by the Iowa Cattleman's Association highlighted that only 49 percent of cow-calf operations had non-family employees compared to 87 percent of feedlot operations. Moreover, only 24 percent of cow-calf operations had multiple non-family employees, as opposed to 52 percent of feedlot operations (ICA 2015a,b).

No statistical differences in any of the obstacle/attraction factors were noted between cow-calf producers that do and do not have a succession plan (Figure 1). However, feedlot operators with a succession plan have higher average ratings for most lifestyle factors (i.e., work hours, rural lifestyle, and self-employment) than do operators without a succession plan. Conversely, those without a plan are somewhat more negative about cost share programs (e.g., EQIP) than are those with a succession plan. Those with a succession plan may have been more likely to utilize state or federal programs to offset feedlot facility design and construction because they had an apparent successor, thereby enabling them to be more progressive and use longer horizons in assessing investment opportunities.

Feedlot operators without a plan are also more pessimistic about capital availability and costs as well as labor availability and costs than those that have a succession plan. These results are similar to the 2004 Iowa Farm and Rural Life Poll where, regardless of farm type, 57 percent of survey respondents would not encourage young people to enter farming, citing capital cost and labor as two of the top five reasons (Lasley 2005).

The future size and structure of the US beef cattle industry will be



Note: One cow-calf respondent was not included in this analysis because they responded "Other" without further explanation to the question, "Is there a succession plan for transferring your cattle operation upon exiting the industry?"

[1]A five-point Likert scale was used for the degree to which lifestyle, policy, and cost and availability factors were perceived as an obstacle or attraction for future generations entering cattle production, with 1 = Major Obstacle, 2 = Obstacle, 3 = Neutral, 4 = Attraction, 5 = Major Attraction.

[2]Means calculated using weights that adjust sample characteristics to match NASS cow-calf and feedlot operation numbers.

[3]Asterisks denote statistical significance of a difference-in-means test between the relevant groups: * significant at 10%; ** significant at 5%; *** significant at 1%.

Figure 1. Comparison of producers with and without a succession plan[1,2,3]

determined by the individual decisions of over 740,000 cattle owners (USDA NASS 2014) and their potential successors. With current demographics, including producer age and an equity distribution skewed to older producers, a large share of productive assets in the beef cattle industry will likely change hands over the next decade.

Public policy will influence how and to whom these assets will be transferred, which, in turn, will

help shape beef cattle production for generations to come. This makes it crucial to explore and evaluate alternative policies so that policymakers, stakeholder groups, and educators can assess possible pathways of successful farm transition. As part of the foundation for this exploration, it is important to understand perceived obstacles and attractions for future generations and identify alternative strategies for addressing and embracing them. Given this improved understanding, targeted educational efforts and innovative approaches to succession plans could be developed.

Future policy and educational efforts should not only be designed to encourage and assist beginning farmers entering beef cattle production but also designed to address long-run challenges and enhance their chances of surviving, prospering, and growing as viable farm operators. Surely, this is, in part, what existing cattle producers are referencing as obstacles for future generations entering cattle production. ■

References

Arbuckle, J.G., and D.W. Baker. 2015. "Half of Iowa Farmers Haven't Identified Successors." Iowa State University Extension and Outreach. Available online at *http://www.extension.iastate.edu/article/half-iowa-farmers-havent-identified-successors*.

Iowa Cattleman's Association (ICA). 2015a. Results of cow-calf labor survey—Spring 2015. Personal communication.

Iowa Cattleman's Association (ICA). 2015b. Results of feedlot labor survey—Spring 2015. Personal communication.

Kimhi, A., and N. Nachlieli. 2001. Intergenerational Succession in Israeli Family Farms." Journal of Agricultural Economics 52: 42–58.

Lasley, P. 2005. "All in the Family, the Decision to Take up Farming." *Agricultural Outlook Forum 2005*. No. 32820. United States Department of Agriculture, Agricultural Outlook Forum.

Mishra, A., C. Wilson, and R. Williams. 2009. "Factors Affecting Financial Performance of New and Beginning Farmers." Agricultural Finance Review 69(2): 160–179.

Schulz, L.L. 2014a. Iowa Beef Center 2014 cow-calf producer survey. Iowa State University Extension and Outreach IBC 101. October. Available online at *http://store.extension.iastate.edu/Product/Iowa-Beef-Center-2014-Cow-Calf-Producer-Survey*.

Schulz, L.L. 2014b. Iowa Beef Center 2014 feedlot operator survey. Iowa State University Extension and Outreach IBC 102. October. Available online at *http://store.extension.iastate.edu/Product/Iowa-Beef-Center-2014-Feedlot-Operator-Survey*.

U.S. Census Bureau. 2013. North American Industry Classification System, May 2013. Available online at *http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart_code=11&search=2012%20NAICS%20Search*.

U.S. Department of Agriculture, National Agricultural Statistics Service (USDA NASS). 2014 Census of Agriculture, United States Summary and State Data. May 2014. Available online at *http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_1_US/usv1.pdf*.

continued from page 9

of a transition from a target of self-sufficiency towards greater involvement in the global marketplace. As the Chinese people demand more pork and beef with rising per capita income, China will likely need more corn and corn substitutes in the future. This need will be amplified with limited arable land, degrading soil quality, and an exodus of rural youth to cities. USDA projects that China will need to import significant amounts of corn—up to 22 MMT—by 2023/24 (Hansen and Gale 2014). The United States, along with Ukraine and Brazil, would likely be a major player if that were to happen. ■

Acknowledgement

The authors gratefully thank Chad Hart, Dermot Hayes, and Kelvin Leibold for their comments and suggestions on an earlier draft.

References

Ballard, E. 2016. "U.S. Sees Big Losses for China From Corn Stocks Write-Down." Wall Street Journal, April 15, 2016. http://www.wsj.com/articles/u-s-sees-big-losses-for-china-from-corn-stocks-write-down-1460656943.

Dim Sums. 2015. "China Plans to Cut Corn Production by 2020." Dim Sums, April 14, 2015. http://dimsums.blogspot.com/2015/11/china-plans-to-cut-corn-production-by.html.

Dim Sums. 2016a. "China Exports Corn to Tajikistan." Dim Sums, March 20, 2016. http://dimsums.blogspot.com/2016/03/china-exports-corn-to-tajikistan.html.

Dim Sums. 2016b. "Corn-Soybean Rotation Subsidy in Heilongjiang Province." Dim Sums, September 5, 2016. http://dimsums.blogspot.com/2016/09/corn-soybean-rotation-subsidy-in.html.

Dim Sums. 2016c. "Liaoning Corn Subsidy 120-180 yuan per mu." Dim Sums, September 17, 2016. http://dimsums.blogspot.com/2016/09/liaoning-corn-subsidy-120-180-yuan-per.html.

Gale, F., M. Jewison, M., and J. Hansen. 2014. "Prospects for China's Corn Yield Growth and Imports." Department of Agriculture Economic Research Service, Washington, D.C.

Hansen, J., and F. Gale. 2014. "China in the Next Decade: Rising Meat Demand and Growing Imports of Feed." Amber Waves. http://search.proquest.com/docview/1536059629?pq-origsite=gscholar.

Hornby, L. 2015. "China's Rotten Grains Highlight Troubled Policy." Financial Times, April 19, 2015. https://www.ft.com/content/6e8581ae-e669-11e4-afb7-00144feab7de#comments.

Iowa Farm Bureau. 2014. "Transportation costs keep China's corn prices high."

Li, G. 2016. "玉米价格还将迎来三波冲击？！-粮油中心李喜贵演讲纪要全文." Retrieved from 华尔街见闻: http://wap.wallstreetcn.com/node/262741.

Ministry of Agriculture of the People's Republic of China (MAPRC). 2015. "农业部关于"镰刀弯"地区玉米结构调整的指导意见." http://www.moa.gov.cn/govpublic/ ZYGLS/201511/t20151102_4885037.htm.

Office of the United States Trade Representative (OUSTR). 2016. "United States Challenges Excessive Chinese Support for Rice, Wheat, and Corn." Office of the United States Trade Representative, Washington D.C. https://ustr.gov/about-us/policy-offices/press-office/press-releases/2016/september/united-states-challenges.

Patton, D., and T. Hogue. 2016. "China's $4.5 Bln in Corn Subsidies to Support Output-Think-Tank." Reuters, August 8, 2016.

Science in China Daily (SCD). 2015. "玉米临时收储政策走到十字路口." Retrieved from Chinese Academy of Agricultrual Sciences: http://www.caas.cn/nykjxx/nycj/259735.shtml.

www.card.iastate.edu

Editor
Catherine L. Kling
CARD Director

Editorial Staff
Nathan Cook
Managing Editor
Curtis Balmer
Web Manager
Rebecca Olson
Publication Design

Advisory Committee
Bruce A. Babcock
John Beghin
Chad Hart
Dermot J. Hayes
Helen H. Jensen
GianCarlo Moschini
Sebastien Pouliot
Lee Schulz

Agricultural Policy Review is a quarterly newsletter published by the Center for Agricultural and Rural Development (**CARD**). This publication presents summarized results that emphasize the implications of ongoing agricultural policy analysis of the near-term agricultural situation, and discussion of agricultural policies currently under consideration.

Articles may be reprinted with permission and with appropriate attribution. Contact the managing editor at the above e-mail or call 515-294-3809.

Subscription is free and available on-line. To sign up for an electronic alert to the newsletter post, go to *www. card.iastate.edu/ag_policy_review/subscribe* and submit your information.

Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. veteran. Inquiries can be directed to the Interim Assistant Director of Equal Opportunity and Compliance, 3280 Beardshear Hall, (515) 294-7612.