

Q3/ 2018

Connected Farms Weather the Storm

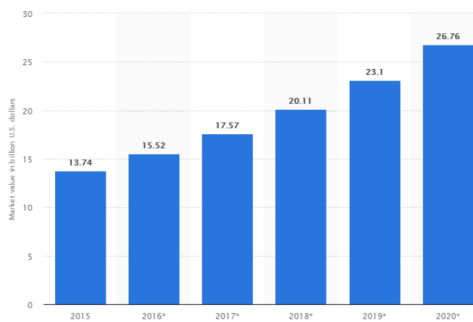
Can data help farmers thrive in challenging conditions?

Technology advancements are giving farmers access to data that supplements — and, in some cases, challenges — their own knowledge and assumptions. Just as restaurant operators can use technology to monitor the status of everything from their ingredient supply to the freshness of food stored on individual shelves of their refrigerator, technology is helping the agriculture industry tap into similar knowledge.

How farmers manage the data available to them has the potential to transform their operation and help it not just compete but simply meet demand: According to the Food and Agriculture Organization of the United Nations, a 60 percent increase in agricultural output is needed by 2030 to keep pace with a growing world population. A recent *Forbes* report details several areas where technology is disrupting agriculture:

- **Internet of Things:** Farmers can collect data from sensors placed in their fields and on their equipment, so they can get alerts about unsuitable soil conditions or a malfunctioning irrigation system.
- **Drones:** Having access to an aerial view of fields helps farmers deliver chemicals to crops more quickly (and without penetrating drinking water) and, through drones that produce 3D images, predict soil quality in advance of planting.
- **Robotics:** New machines are helping farms change how they care for and harvest the crops they produce, from John Deere's spraying and weeding robots, which reduce agrochemical use by 90 percent, to robots that can handle the harvesting of crops once deemed too fragile for handling by anything but human hands.

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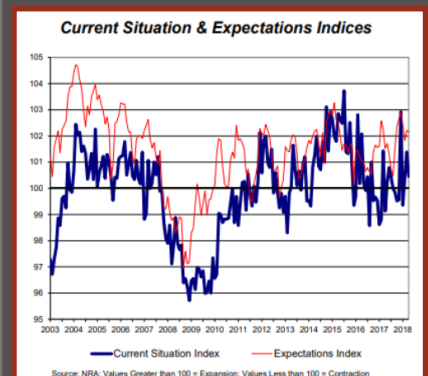
Forecasted market value of smart agriculture worldwide from 2015 to 2020.

Source: Statista

EXPANSION MODE

Operators are optimistic about conditions in coming months

The National Restaurant Association's latest economic indicators, announced May 31, show operators are optimistic about the health of the restaurant industry. The Restaurant Performance Index, Current Situation Index and Expectations Index all registered slight declines but all remain solidly above the 100 mark, indicating an industry that is expanding, with business owners feeling positive about economic conditions in the months ahead.



USDA forecasts final 2018 results and looks ahead to 2019

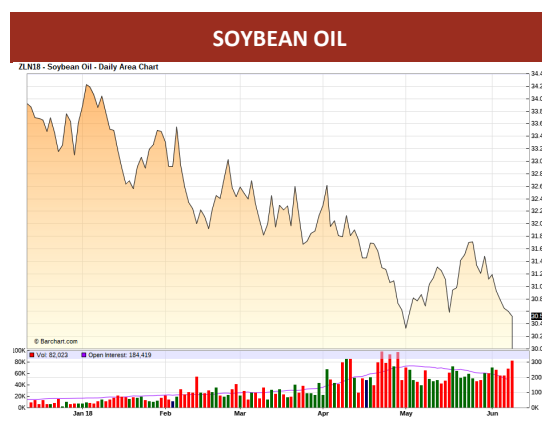
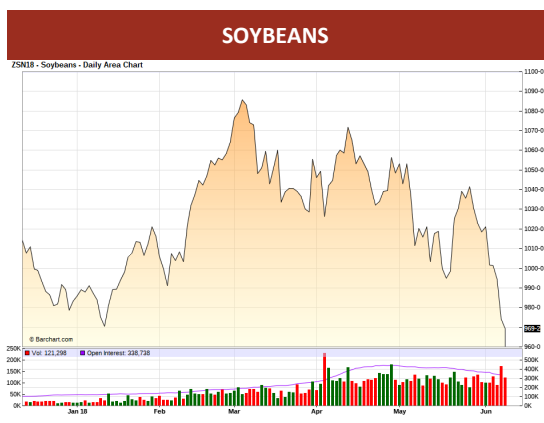
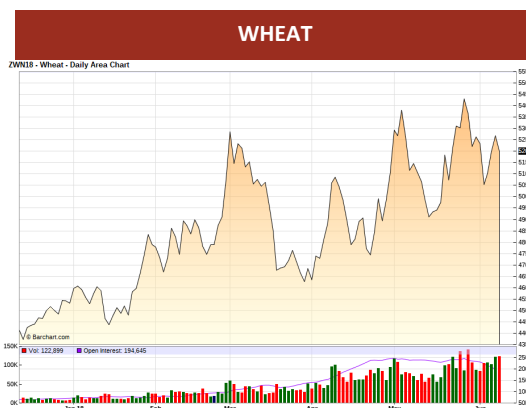
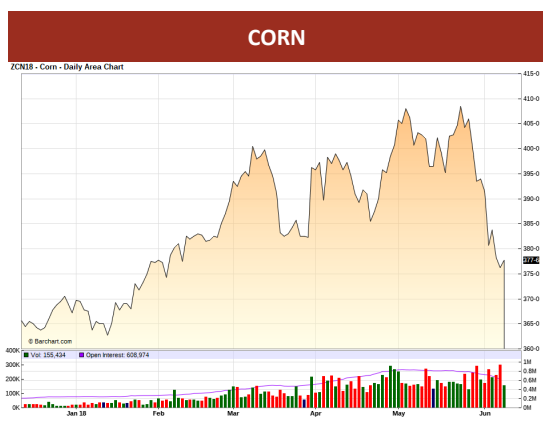
The U.S.D.A. expects agricultural trade for fiscal year 2018 to decline \$500 million from its November forecast and \$1 billion from the same period last year, according to the agency's Outlook for U.S. Agricultural Trade report released in May. While higher forecasts for beef, pork, dairy, grain and other commodities are expected to boost exports, those gains aren't expected to offset a 6 percent drop in oilseed and product exports. Here is a closer look at trends in key commodities, according to USDA research, along with Barchart.com charts mapping the past six months of commodity values:

Wheat: The U.S. wheat crop for 2018-2019 is projected to increase 5 percent from the previous year due to a larger harvested area and slightly higher yield. The total wheat yield is projected at 46.8 bushels per acre, up slightly from 2017-18. The USDA World Agricultural Outlook Board says approximately 36 percent of winter wheat production is within an area experiencing drought – and winter wheat yields are below average in states including Kansas, Oklahoma and Texas. Considering those challenges, it helps that combined spring wheat and durum production for 2018-19 is projected to increase

34 percent from the previous year's low, due to both increased area and yield.

Corn: The 2018-19 corn crop in the U.S. is forecast to dip based on smaller growing area and lower yield amid a decrease in feed and export prospects, though a strong outlook for corn used for ethanol will help offset the declines. Supply for the year is still at its third-highest level ever, but is 675 million bushels shy of last year's record high of nearly 17 billion. U.S. 2018-19 corn exports face tough competition as combined exports from Argentina, Ukraine and are expected to increase by more than 8 million tons.

Soybeans: The USDA's projection of the 2018-19 soybean crop is 4.28 billion bushels — lower than projections for the previous two soybean crops, although much larger beginning stocks could expand the 2018-19 total supply to an all-time high of 4.84 billion bushels. The abundant supply could boost U.S. soybean exports in 2018-19 to a record 2.29 billion bushels.



(commodity charts source: Barchart.com)

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Data

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- **Tracking:** RFID sensors can help farmers (and consumers) ensure that the crops they produce are safe from the time they are harvested to the time they are sold.
- **Data mining:** Having access to large quantities of data can help farmers better identify trends and change how they plan for the future, such as changing how farmers work with plant breeders to develop new crops.

While farmers can't change the weather, technology advancements will increasingly help them access real-time information on a vast scale that enables them to respond more quickly to an E. coli outbreak — or any number of other conditions that impact their operation. As the market for agriculture technology continues to expand, farms, like restaurants, will need to identify the technology that helps them serve customers.

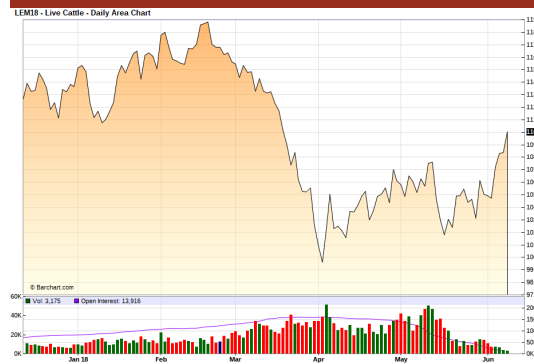
Commodities

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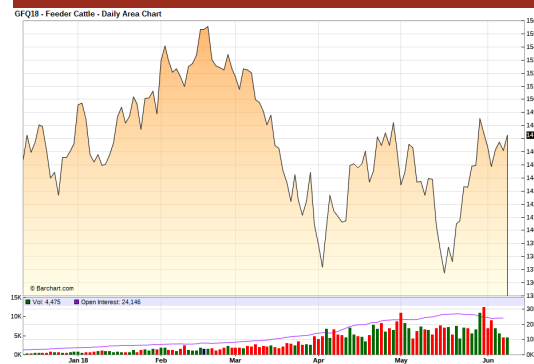
Cattle: Plant-based diets may be growing in popularity but beef is holding strong. The USDA expects commercial beef production in 2019 to climb to 27.7 billion pounds, 1.8 percent higher than projected 2018 production. Increased U.S. production and continued demand from Asian markets could lift beef exports to a consecutive record high in 2019. The strength of domestic and international demand could boost prices of fed cattle slightly higher in 2019.

Pork: Commercial pork production is expected to climb 3 percent in 2019. Higher processing costs are expected to keep margins (and demand) in check, with hog prices averaging \$43-\$46 per cwt. Favorable U.S. pork prices relative to those of other countries will help maintain international competitiveness of U.S. pork in 2019.

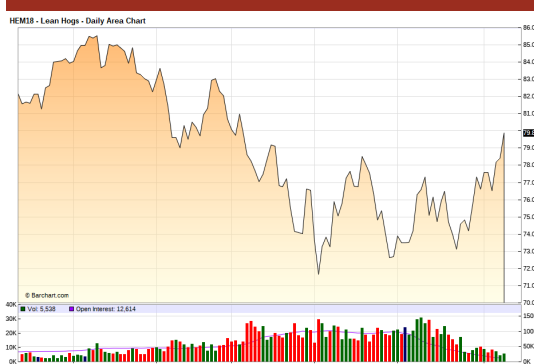
LIVE CATTLE



FEEDER CATTLE



LEAN HOGS



THREE TRENDS

Highlights from the floor of the National Restaurant Association Show 2018

Flower-flavored beverages (like elderflower and rose)

Familiar ingredients, new uses (like beet salsa)

Creative plant-based proteins (like a raw tuna alternative made from tomatoes)

Source: Mintel

