



Nine Trends Transforming the Agribusiness Industry

The agribusiness industry is undergoing a period of considerable change across numerous fronts. From changing consumer food preferences and related shifts toward “clean label” products, to sustained low commodity prices for farmers, to the recent surge in AgTech development and adoption, the agribusiness sector finds itself in the midst of enormous changes and dynamic trends that will continue to shape how food is grown, raised and produced for years to come.

Among numerous forces at play across the agribusiness value chain, we have identified nine key trends that are driving transformation within the industry (see Figure 1). These trends touch virtually every part of the agricultural value chain, including growers, input suppliers/distributors, processors and investors, and are relevant to crops and animal proteins alike.

While these trends are complex — with many interdependencies and differential degrees of impact, depending on where across the “farm to fork” chain one chooses to look — we have developed a brief synopsis of each and its respective impact on the industry based on L.E.K. Consulting’s experience.

1. Sustained low commodity prices

Agricultural crop commodities such as corn and soybeans are in their fourth year of sustained low prices, following several

bumper years of historically higher prices. This has had a significant negative impact on farm incomes, debt levels and land values, making times very tough for growers. However, they are not alone — input providers for seeds, crop chemicals, nutrients and particularly equipment have seen moderate to severe declines in demand as farmers have been forced to tighten their belts and reduce spending. With farmers being more selective in how much and what types of inputs they use while crop prices remain low, agricultural input manufacturers and retailers have also felt the pinch.

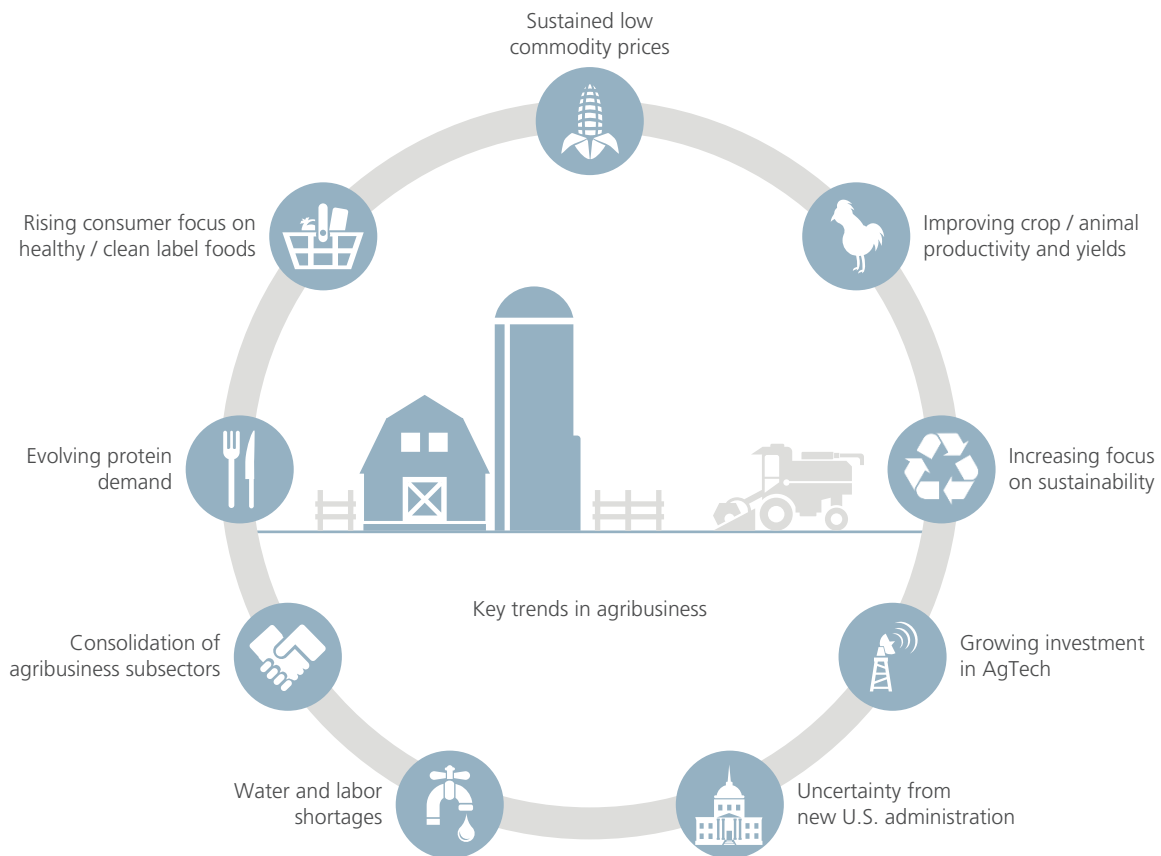
The outlook for recovery of crop prices remains uncertain and continues to weigh on input providers. Given the slow and steady growth of commodity crop demand, prices are most likely to move based on changes in supply, which has not been sufficiently volatile in recent years to help raise crop prices.

2. Improving yields

Optimizing crop and animal yields has been a primary goal of both growers and governments alike for millennia. Over the past century, however, yields for major crops have increased by three to eight times as a result of technological advancements, agronomic improvements, and industry investment and collaboration. This pace has accelerated further in the past 20 to 30 years and more recently due to several key drivers:

- Significant growth in R&D investment in agricultural biotechnology (e.g., for developing high-performance seed traits, more effective crop-protection chemicals and biologics, etc.)

Figure 1
Key trends transforming the agribusiness sector



Source: L.E.K. analysis

- Greater collaboration across industry, government and academia
- The emergence of “smart” farming and data analytics that enable precision agriculture

On the animal proteins side, yield gains have been much more gradual, yet they remain important for producers in order to meet growing demand and generate returns. Although low crop prices have benefited animal protein producers in the form of cheaper feed costs, other trends — such as reduction in the use of growth hormones and antibiotics — have challenged growers’ efforts to maintain, much less increase, animal protein yields. Technology is helping here as well, with key drivers including:

- Improved genetics of grandparent breeding stock
- More tailored feed additives (enzymes, probiotics, micronutrients, etc.)
- Technology-enabled production monitoring systems

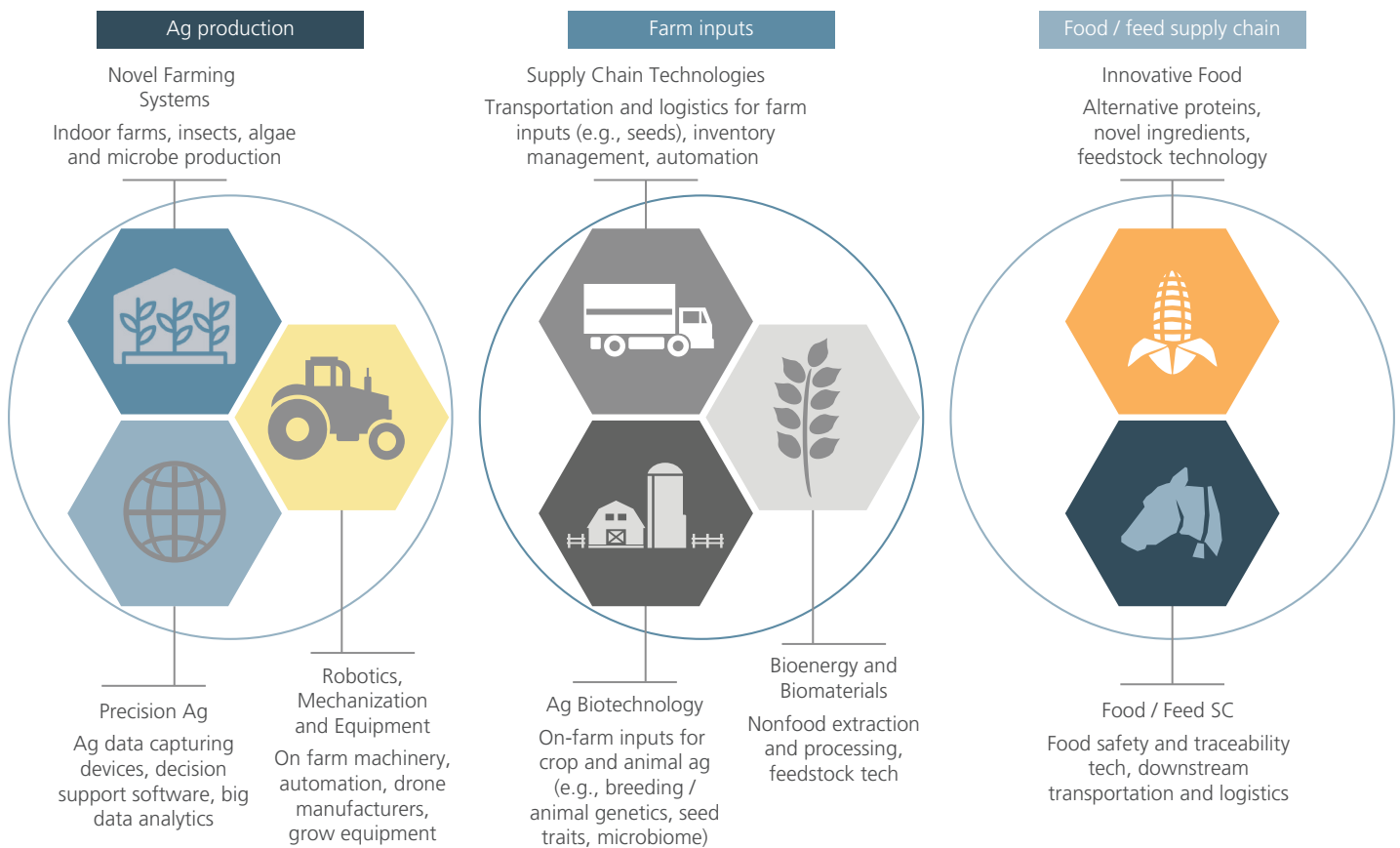
3. Focus on sustainability

The drive toward greater sustainability has affected the agribusiness industry in many ways, despite the challenges associated with finding a common and/or consistent definition of what “sustainability” really means. For crop growers, sustainability usually covers growing as much or more food with fewer inputs, using sustainable soil management practices, perhaps shifting from chemical to organic pesticides, and so forth. Advances in biotechnology and precision agriculture have been important enablers of more sustainable agriculture broadly, as they allow growers to be more precise and to optimize the yield-related traits of a crop or an animal. At the same time, but in a different manner, organic crop, produce and animal protein growers also view their approach as a positive for sustainability.

Sustainability, however one defines it, is an increasingly important issue for many parties:

- For growers, it is essential to preserving the long-term health and productivity of their soil and fields

Figure 2
Growing investment in AgTech spans three main segments



Source: AgFunder, L.E.K. analysis

- For public sector officials, sustainability also matters, but the underlying issues emphasized may differ between federal and local officials
- For food and beverage companies, as well as other consumer-facing companies, demonstrating a pro-sustainability approach may be an important element of meeting consumer brand expectations
- For suppliers, driving yields upward and enabling growers to produce sufficient food with the arable land available are often critical sustainability objectives

4. Arrival of AgTech

Over the past five to 10 years, the growth of agricultural technology has been fervent, with technology being applied in radically new ways in the field, around the farm, for raising animals, and all the way across the farm-to-fork supply chain (see Figure 2). Crop biotech, the traditional pillar of AgTech, continues to advance, spawning a host of new seed types and traits,

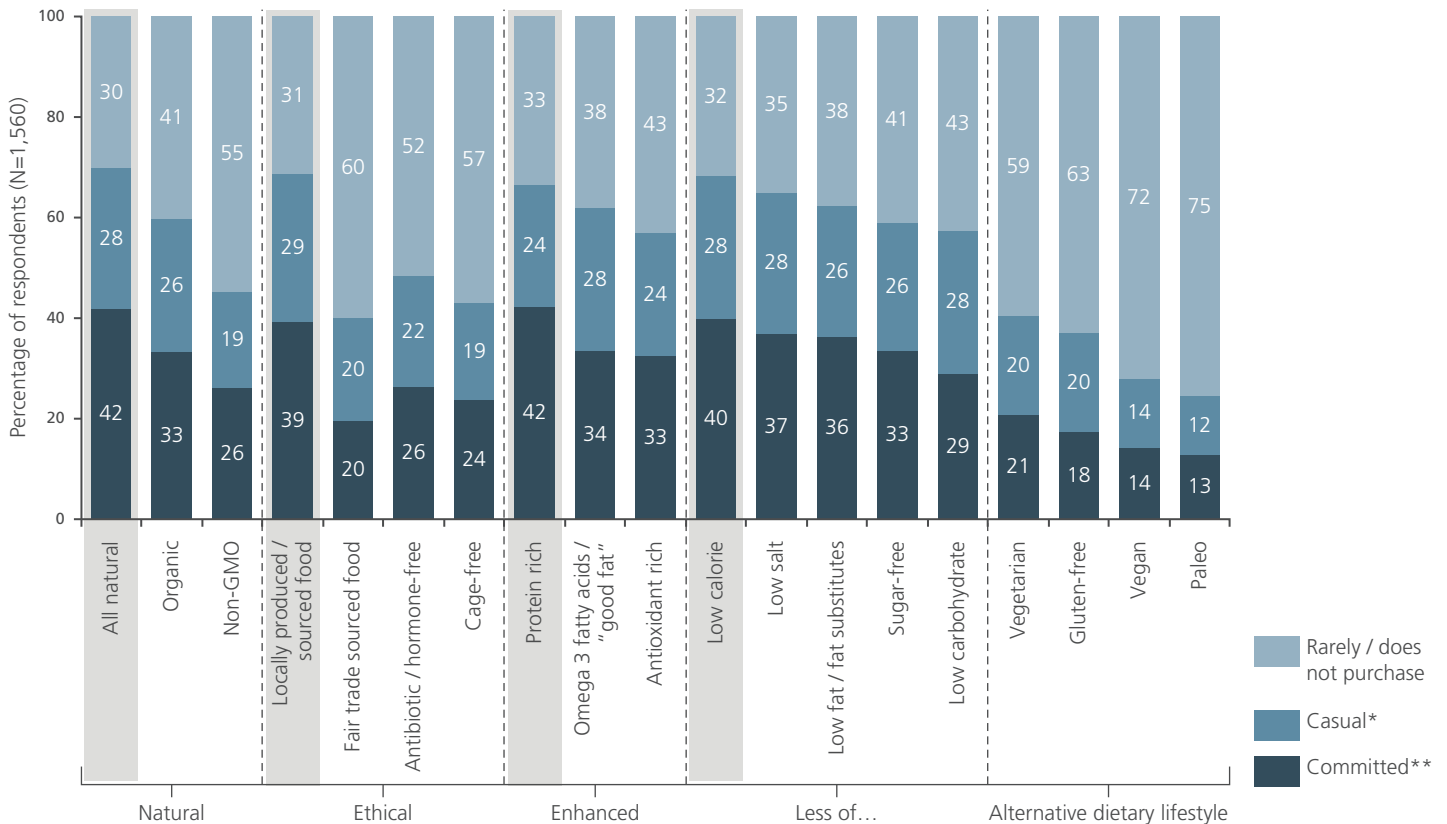
more effective crop protection and enhancement chemicals, and (increasingly) biologic compounds to augment or replace conventional crop chemicals.

Over the past six years, the number of AgTech deals grew at an annual average rate of 73%, with a total investment of \$3.2 billion in 2016. Over this time frame, AgTech investment by agribusiness operators has also expanded, as shown by the following examples:

- **Precision/prescriptive agricultural technologies** — Software, data and equipment are providing growers with a wealth of field and crop health data, which enables yield improvements and provides intelligence to assist with variable-rate application of fertilizers and chemicals.
- **Indoor growing technologies** — Advancements have been made in controlled growing environments, from next-generation hydroponics to “vertical” farming, particularly for produce/greens. While more costly to produce than their

Figure 3
Increasing focus on purchasing clean-label foods

Purchasing frequency by attribute (US)
(2016)



Note: *Casual defined as purchased occasionally; **Committed defined as purchased frequently or always
Source: L.E.K. consumer survey

farm-raised alternatives, products from such operations can be attractive to retailers seeking a year-round supply of locally sourced, often organic offerings.

- **Animal protein production** — Technology has accelerated developments in animal breeding, nutrition and health in a number of ways. Animal protein producers are using technology in new ways to monitor animal health and track and optimize production.
- **Meat replacements** — As consumer interest in nonanimal sources of protein grows, technology is driving advancements in so-called meat replacements, produced through innovative (and still very expensive) cell tissue culture technologies. While still in their early days, such technologies and the companies behind them, such as Beyond Meat and Memphis Meats, have attracted the investment of majors such as Tyson Foods and Cargill, respectively.

- **Food safety/traceability tracking** — To help address food safety concerns and enormous public scrutiny, major retailers and foodservice operators have been using technology to improve their management of food safety issues and track the origin of food products and ingredients all the way back up the supply chain.

5. Clean-label shift

The seismic shift in consumer food preferences continues to drive the growth of ingredients with healthy, clean-label attributes: organic, non-GMO, antibiotic-free, gluten-free, cage-free, etc. (see Figure 3). A recent L.E.K. survey of more than 1,500 U.S. consumers indicated rising consumer commitment to and interest in clean-label foods across a variety of such attributes. Almost 70% of respondents always, frequently or occasionally purchased foods labeled "all natural," "locally produced/sourced," "protein-rich" or "low-calorie." Furthermore, U.S. organic food sales have grown approximately

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10% per annum from 2005 to 2016, and are expected to reach approximately \$50 billion in 2017, spurred in part by consumers seeking more alternatives, as well as by CPG companies, food retailers and fast-food/restaurant operators vying for share of the consumer “food wallet.”

The implications of this shift farther upstream in the agribusiness portion of the ‘farm to fork’ value chain have been enormous and widespread. For food ingredients to be “organic” requires starting with non-GMO wheat, corn, soy, oils, starches and other ingredients, which in turn impacts the costs for growers, producers and consumers. Similarly, producing eggs in a cage-free environment or raising chickens without antibiotics is typically costlier and requires significant upfront investments by growers and producers to shift their practices and qualify for the label they seek. As long as there is consumer demand for the broad array of clean-label foods at the right prices, however, growers and producers will almost certainly find ways to supply them.

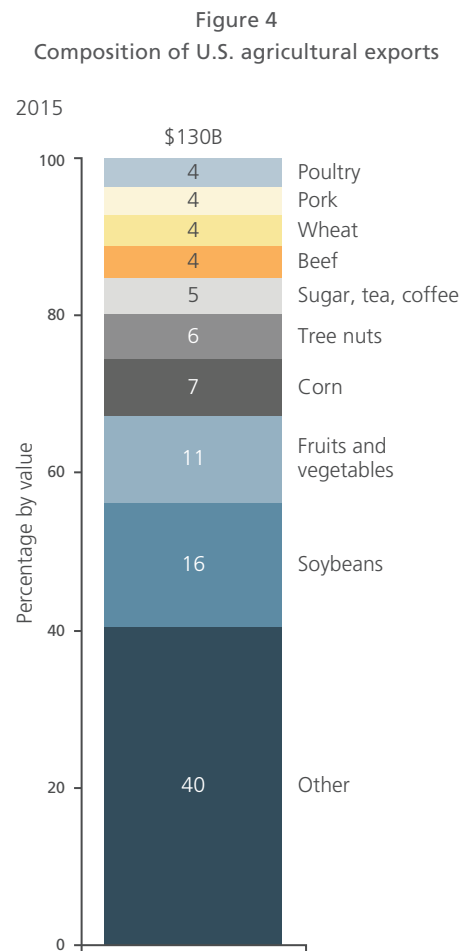
6. Evolving protein demand

Global per-capita consumption of animal-based protein has inched up steadily since the 1960s as incomes and population levels in developing countries have risen, with the greatest increases observed in poultry and pork. In more economically developed regions such as the U.S., the EU and parts of Asia, consumption of animal proteins is growing modestly, yet nonanimal proteins (plant-based, insect-based, etc.) are seeing more rapid growth, with one analyst predicting that meat alternatives could have a 33% share of the overall protein market by 2054.

As plant-based proteins become more mainstream, large corporations are beginning to adjust their offerings; for example, Wendy’s, Denny’s, Subway, White Castle, Chili’s, TGI Fridays and others now offer plant-based protein meals. Given shifting consumer preferences, and the efforts by large food companies to stay relevant, it is likely that future protein needs will be met by an even more diverse, and less animal-reliant, set of protein sources.

7. Industry consolidation

Industry consolidation has been playing out for many years to varying degrees across the agribusiness sector landscape



Source: USDA, L.E.K. analysis

in agricultural equipment and inputs (seeds, chemicals and fertilizers); animal protein production; and “niche” segments such as poultry grow-out equipment, produce sorting and grading equipment, and animal protein genetics. Most recently, the megamergers in the agricultural seed and chemicals space (DowDuPont, Bayer-Monsanto and ChemChina Syngenta) are increasing industry concentration significantly further than ever before. Overall agriculture-chemical mergers and acquisitions have grown rapidly in recent years, totaling over \$120 billion in 2016, compared with just under \$60 billion in 2015 and a mere \$10 billion in 2014.

In fertilizer, PotashCorp and Agrium, the two largest fertilizer companies in Canada, have agreed to merge, forming a \$27 billion company that combines PotashCorp’s mining capabilities with Agrium’s retail capabilities. Within the agricultural retail and distribution space, consolidation has not been so swift. Yet new mergers and acquisitions are announced regularly as large regional and national players seek economies of scale and better buying power with the major suppliers. The newfound scale of farm input manufacturers and suppliers is of concern to some growers,

who fear higher prices and less choice down the road. However, new technology and ceaseless innovation continue to fuel new companies in all these spaces.

8. Water and labor shortages

Water limitations and labor shortages have been persistent issues for agribusiness in the U.S. and other parts of the world for years. While a snowy winter last year has brought California much-needed drought relief, historical data and climate models suggest that California and the southwestern U.S. will continue to experience desertification over the next several decades, making water a sustained, long-term issue.

Globally, agriculture uses about 70% of available fresh water. Observed changes in climate, shifting land uses and more intensive crop production trends are all believed to be putting more strain on the world’s water systems. Water-scarce countries, such as Israel, have developed leading-edge technologies to

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combat the shortage and are global leaders in precision drip irrigation to optimize the water uptake by crops.

Labor shortages, particularly in the U.S., are also becoming a significant issue, as growers across the country struggle to find the seasonal labor they need for planting, harvesting and other activities. Although this has been a challenge for many years, conditions have become even more acute recently as a result of low overall unemployment, recent government immigration moves and minimum-wage increases in various parts of the country. In the short term, this is putting pressure on high-cost agricultural growers and making it harder to stay in business. Over the longer term, however, sustained water and labor shortages are likely to drive up consumer prices for a range of fruits, vegetables, greens and other foods that people eat.

9. Uncertainty from new U.S. administration

Potential changes to established global trade agreements by the current U.S. administration have not yet affected the agribusiness sector, but the likely economic impact of such disruptions would be significant on a range of crop farmers and animal protein growers. The U.S. is a major exporter of commodity crops, specialty crops and animal proteins: NAFTA, the WTO, and other multilateral and bilateral trade agreements have enabled U.S. producers to export growth in the past. For example, U.S. beef exports have risen 78% by volume since 1993, the year prior to

NAFTA's enactment, with Mexico the largest foreign buyer of American beef and Canada the fourth-largest foreign buyer. The risk for exports to China, one of the largest export markets for American agriculture, is similar.

To date, despite numerous signals emerging from the administration on trade and agricultural policy, the agribusiness industry remains largely unclear as to what could/will change and how the changes might impact them. Despite some minor trade wins recently around beef exports, many in the industry fear that export markets are potentially at risk should trade deals be canceled or renegotiated.

Conclusion

These trends are certainly not the only dynamics impacting the agribusiness industry — there are many more factors at play that are driving the evolution of the global farm-to-fork ecosystem. As these changes unfold, and in some cases, accelerate, they are almost certain to create opportunities for companies that are able to drive and/or adapt to the increasing disruptions across the industry. At the same time, these forces will challenge companies that are slow or unable to react. And while the recent industry upheaval has been enormous, there is strong evidence to suggest that this is just the beginning of a much more profound shift that is likely to continue for decades.

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