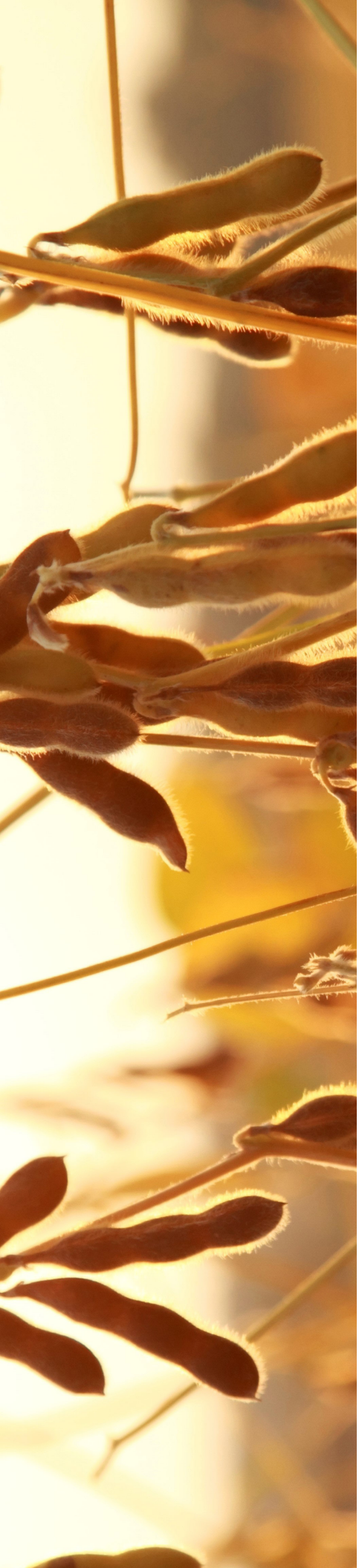


Commodity Market Intelligence Update No. 3

Issue feature: Soy

Finance and the Cerrado

Rising global demand for soy is driving increased investments in the Cerrado, Brazil's vast tropical savanna that is home to some 12,000 plant and animal species. These investments are accelerating land conversion, and come in two forms: infrastructure projects, which reduce the costs of production; and land acquisitions made by financial institutions and investment funds seeking returns from growing commodity production. Cropland in the Cerrado, and specifically in the region known as *Matopiba*, which comprises the Northeastern states of Maranhão, Tocantins, Piauí, and Bahia, and 17% of Brazil's land area, more than doubled between 2000 and 2013, and is continuing to grow as international pressure mounts to protect the biome. With only 7% of the Cerrado legally protected, infrastructure coming online, and foreign investment laws potentially set to ease, the Cerrado is being established as a frontier of land conversion in Brazil.

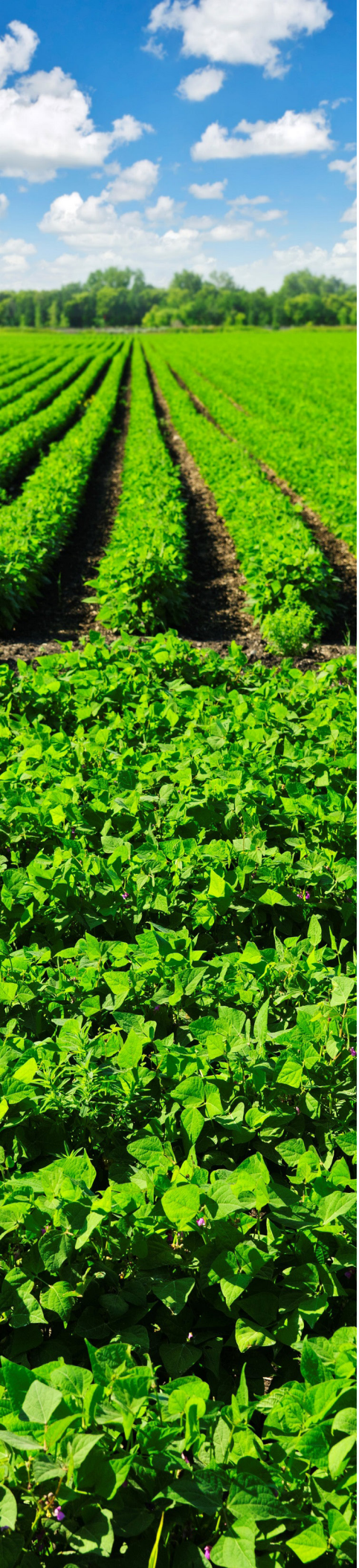
Over half of the Cerrado's 73 million hectares of native landscape were converted between 2000 and 2015, largely driven by livestock and soybean farming. Though the Cerrado has not attracted as much attention as the Amazon, the conservation value of the region is enormous. The Cerrado is home to 137 species of endangered animal, and over 40% of its 11,000 plant species are endemic. Hidden biomass in the Cerrado landscape of small trees with deep root systems allows the region to sequester around 58 tons of carbon per hectare, helping to mitigate climate change at a comparable rate to the Amazon. Additionally, empirical studies have confirmed regional climactic effects from land conversion in the Cerrado; notably, elevated fire and drought patterns which directly threaten the ecological integrity of both the Cerrado and the Amazon. An ecologically intact Cerrado can help deliver value for agricultural business by providing climate predictability and regulation. Finally, half of Brazil's major river and wetland systems begin in the Cerrado, making the biome a critical water collection ecosystem and reliable source for Brazil's hydroelectric power.

It is the Cerrado's agricultural capacity, however, rather than its ecological value, that is attracting foreign business and investment interests. Surging acquisition of Brazil's agricultural land from 2000-2009 led the country to limit the ability of foreign companies to acquire land for large-scale agriculture. A 2010 restriction prevented foreign companies from owning more than 25% of the rural lands of any municipality and capped at 5,000 hectares the maximum amount of land a foreign company could purchase. Foreign investment has persisted, however, sometimes by taking advantage of loopholes in the law by dealing with local intermediaries. For example, U.S.-based financial services company TIAA operated through a Brazilian company, Cosan, to steadily acquire land in excess of the capped amount in nine Brazilian states between 2008 and 2015. A third of these landholdings, which activists allege had been illegality cleared, lay in Matopiba, illustrating the interplay between foreign finance, global soy demand, and land conversion.

Today, agricultural development in Matopiba is occurring through multiple channels. Ten foreign-owned agribusiness firms collectively control 1 million hectares of arable land in the region. These significant landholdings are often planted with soy, and are part of the 4 million hectares of land currently producing the commodity within Matopiba. These firms are owned by Canadian, American, European, and Japanese multinational financial institutions, and receive significant global financing and investment to carry out their operations on the ground. Global private equity funds are also increasingly interested in agriculture. As of 2017, 15 unlisted investment funds employing $2.5 billion in capital are targeting agriculture in Latin America. As laws potentially change, these funds could be permitted to buy up large tracts of Brazilian land, possibly driving further land conversion in the Cerrado.

Billions of dollars in new infrastructure investments are also gradually changing the dynamics of soy production in Brazil. Investments in Matopiba, such as new railways, freshly paved roads, and expanded grain terminals and ports have significantly reduced costs for producers and traders, sometimes by up to 50% compared with other Brazilian soy producing regions, accelerating the business case for soy production and incentivizing further investment. Infrastructure investments have been made by an array of transnational actors, including Brazilian public banks, global soy traders, foreign state-owned companies, and indirectly through government financing made by sovereign wealth funds.

Commodity Market Intelligence Update is a publication of the Good Growth Partnership's **Responsible Demand** Project



Investment in Brazilian agriculture is also emerging as a key strategy for importing countries like China. Accounting for over 50% of Brazilian soybean exports, and a third of soy exported from the Cerrado, China is keen to ensure the uninterrupted flow of soy to supply animal feed for its expanding meat industry. In 2017, Chinese investment in Brazil hit a record high, as companies completed 17 infrastructure and acquisition deals, some directed towards bringing soy to port. China's Citic Agri Fund has made $2.5 billion available for new agricultural investments in Brazil, including for the cultivation of soy and rice, and Chinese groups have made legal direct purchases of agricultural land for soy production. Chinese agricultural investment has generally been targeted in Mato Grosso but may expand to Matopiba as available infrastructure and costs of production continue to gain advantage over other regions.

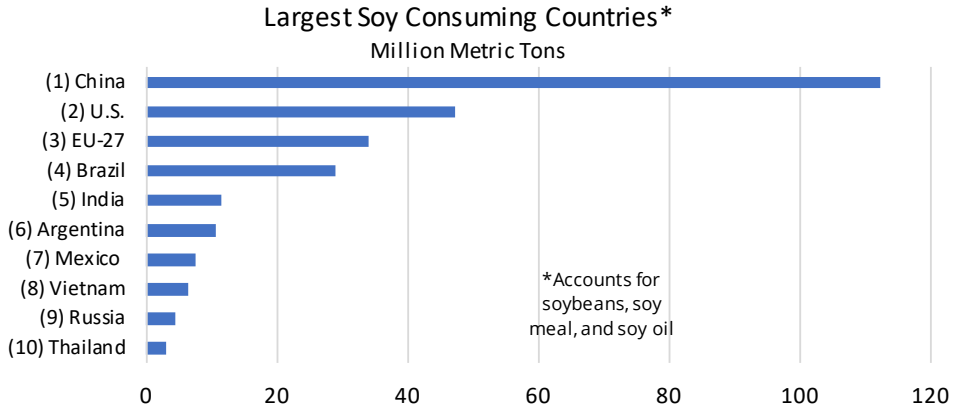
There is heightened awareness of the value of land in the Cerrado – both by conservationists who aim to protect it – and by businesses who seek its development to feed growing demand for soy. Measures like the voluntary 2006 Soy Moratorium have been successful in limiting deforestation in the Brazilian Amazon, but have not been extended to frontiers of soy production like the Cerrado. In 2017, broad recognition of the Cerrado's extraordinary ecological value led to the Cerrado Manifesto, a pledge to halt any further deforestation or native vegetation loss in the biome that was signed by over 60 global companies, signaling a desire to eliminate land conversion from their supply chains. Still, both the growing scale of international investment and plethora of actors involved underscore the difficulty of balancing soy production with conservation in the Cerrado.

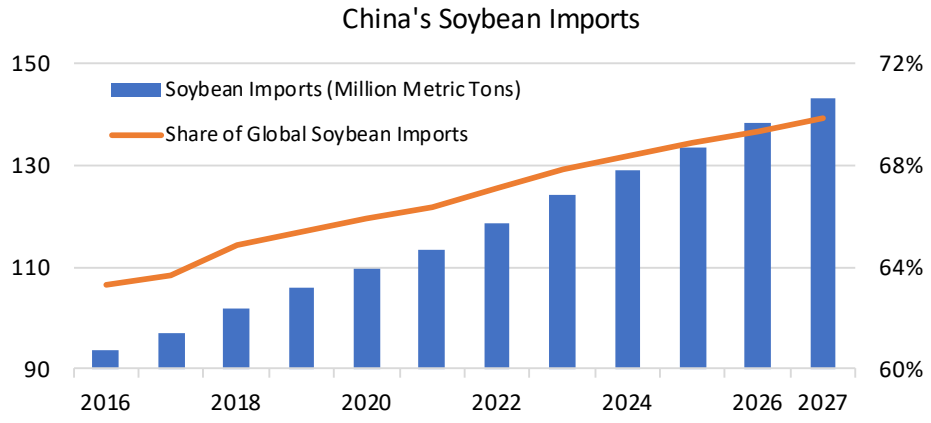
Agroideal - Sustainable Agriculture in the Cerrado

18 global and Brazilian soy traders, banks, NGOs, consultancies, and research organizations have launched Agroideal, a decision support tool that facilitates sustainable commodity production in Latin America. An open-source tool targeted at decision-makers in the soy supply chain, Agroideal allows users to direct sourcing, planting, and investment strategies to areas that meet environmental pledges regarding the sustainable expansion of soy production. The tool currently covers soy for the entire Brazilian Cerrado, with plans to extend to the Argentine Chaco. A beef version of Agroideal covering the Amazon, Cerrado, and Chaco biomes will be launched in 2019.

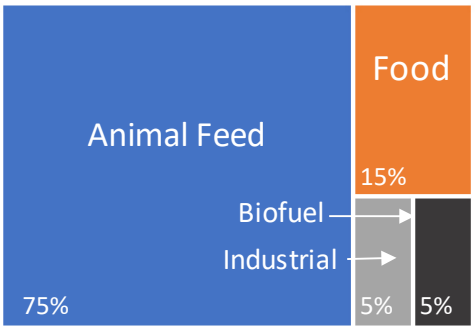
Trends in Soy Demand

China continues to be the leading driver of global soy demand (first chart below). In 2017, China accounted for almost two-thirds of global soybean imports, a share expected to rise to 70% by 2027 (second chart below). Over half of China's soybean imports were sourced from Brazil, including from the Cerrado. China's rapid development has led per-capita meat consumption to quadruple since 1990; 80% of China's soybean consumption is used to produce feed for animals raised for their meat. Soybean oil, a byproduct of China's large-scale soy crushing operations, is even starting to displace imported palm oil as a cooking oil and food ingredient. Chinese companies have been investing heavily in Brazil, including to ensure the steady flow of soybeans to Brazil's ports. Escalating trade tensions between China and the U.S., the second largest soybean exporting country, may mean even greater Chinese demand for Brazilian soy in the future. *Source: USDA and author's calculations. Consumption accounts for double counting of soybeans crushed for soymeal. Data as of end-2017.*

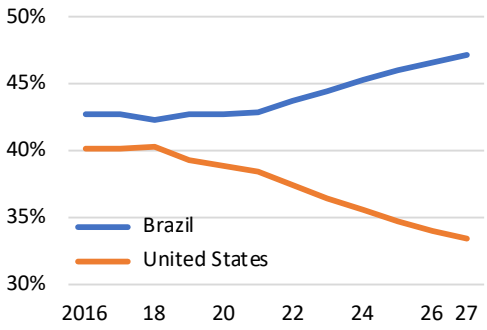




Global Soy Consumption by Uses



Share of Global Soy Exports

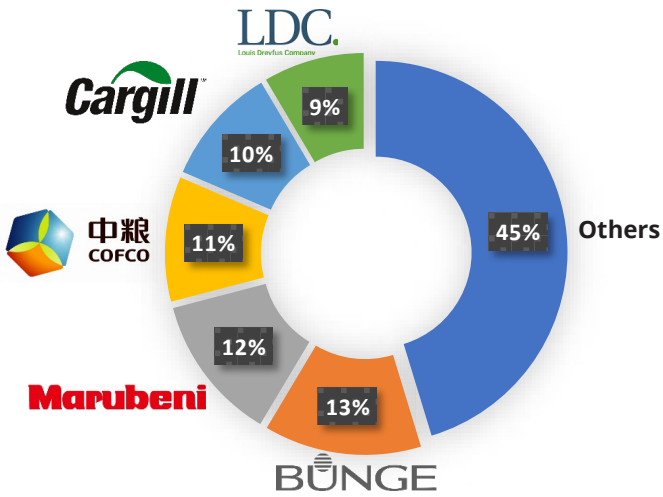


Rising global demand for animal protein-based diets is a key driver of soy expansion. 85% of all soybeans are crushed to produce soymeal, the majority of which is used to feed animals raised for their meat, eggs, and milk (first chart above). Whole soybeans, soymeal, and soy oil are also used in food products, like tofu, as a cooking oil; in biofuels; and for some industrial applications such as adhesives. Brazil currently supplies 42% of global soybean exports, but land expansion, infrastructure investments, and an advantage in soybean protein content is expected to raise Brazil's export share to 47%* by 2027 (second chart above). Conversion of native vegetation for soy cultivation is occurring in biomes with high conservation value, like the Brazilian Cerrado and the Paraguayan and Argentine Gran Chaco. *Source: USDA, World Wildlife Fund, and author's calculations. *Adding Argentina, their combined market share becomes 54%.*

Soy Traders and Infrastructure

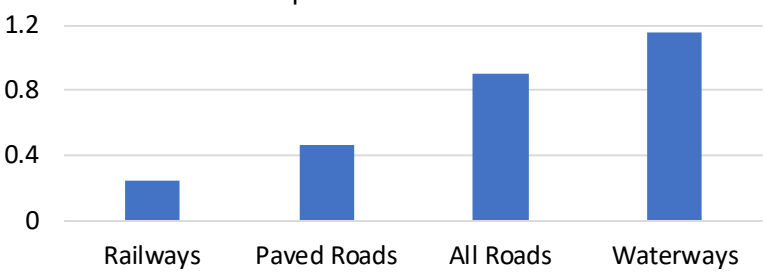
Brazil's landscape of soy traders and infrastructure is evolving. Bunge, which exports 13% of Brazilian soybeans (first chart below), is in discussions to be acquired by rival commodity traders (see Key Companies Update), and new entrant COFCO has emerged as the third-largest exporter of Brazilian soybeans. COFCO is seeking to make further inroads in Brazil, including increased investment in Mato Grosso, which accounts for 25% of Brazil's soybean production. Increased infrastructure investment in Matopiba, not only from soy traders, but also from Brazilian public banks and foreign state-owned companies, has greatly reduced the costs of producing and exporting soybeans from the region. The average distance to railways and paved roads, which account for 90% of grain cargo transported in Brazil, is now less than half as far in Matopiba as Mato Grosso (second chart below), adding pressure to expand production in the region.

Largest Exporters of Brazilian Soybeans
2017, in % of total shipped volume



Source: Williams Shipping Agency, via Reuters. "Others" include soy traders such as Grupo Amaggi, BTG Pactual, and Coamo, as well as undisclosed and smaller exporters.

Ratio of Distance to Infrastructure
Matopiba vs. Mato Grosso



A value of 0.45 for "Paved Roads" means that the distance to paved roads in Matopiba is, on average, only 45% as far as in Mato Grosso. Source: Brazil Institute of Geography and Statistics, and author's calculations. Data as of 2017.

Key Companies Update (all commodities)

Bunge, one of the largest exporters of Brazilian soybeans, is in discussions to be acquired by rival commodity traders. Both Archer Daniels Midland (ADM) and Switzerland's Glencore have expressed interest in a takeover, foreshadowing consolidation among large commodity traders as a global grain glut has squeezed profit margins. However, antitrust issues mean any potential deal will take time to materialize.

An ADM-Bunge merger would allow ADM to significantly expand its presence in Latin America by acquiring numerous ports, grain mills, refineries, and soy crushing plants in Brazil and Argentina. A combined entity would roughly match the size of Cargill, the largest commodity trader in terms of revenue, and would be capable of processing 25% of global soybean production, according to Bloomberg. It would become Argentina's largest grain exporter, overtaking COFCO's 17% share of grains, including wheat, corn, and soy, shipped from the country. Glencore is currently a much smaller player in Brazilian soy.

Bunge also handles 4% of globally shipped palm oil, and last year ventured into palm oil-based food ingredients after acquiring IOI Loders Croklaan. Both ADM and Bunge have soy and palm oil sustainability policies that would need to be aligned following a merger, including policies on traceability, zero deforestation, as well as how soybeans are sourced from the Cerrado biome.

Italian chocolate and confectionary manufacturer Ferrero, seeking to diversify its business away from Western Europe, has acquired the U.S. confectionary unit of Nestle for $2.8 billion. Many confectionary products manufactured by the two companies use palm oil, palm kernel oil, and palm oil derivatives as primary ingredients. Ferrero used 181,000 tons of palm oil in 2016, with 100% of its volume certified to the RSPO standard. Nestle used over 400,000 tons of palm oil for its global operations in 2016 and has a 2020 goal of 100% RSPO-certified palm oil.

While Nestle commands a 10% global market share for confectionary products, it is unclear what volume of palm oil is directed towards products sold in the U.S. market. The U.S. accounts for about 20% of global chocolate sales, and Ferrero will take control of over 20 confectionary brands, such as Butterfinger and 100Grand, becoming the third-largest confectionary company in the U.S., behind Mars and Hershey. Ferrero has emerged as a sustainability leader among food manufacturers, using 100% RSPO-certified segregated palm oil in its supply chain beginning in 2015. Ferrero has also published a list of 116 of its palm oil suppliers, but has not stated what volume of its palm oil they cover. Nestle has similarly published a list of direct suppliers, representing 91% of the company's total palm oil volume.

Ruchi Soya, India's largest edible oils manufacturer, is undergoing bankruptcy proceedings, and will likely be acquired by one or more large global edible oils companies. Ruchi is India's largest player in cooking oil and soy foods, with a 19% market share in India's enormous edible oils market, reaching over a billion consumers. The company produces popular soy and palm oil-based cooking oils Ruchi Gold and Mahakosh, and operates 14 refineries across India, which are coveted by bidders. Ruchi Soya has a 2020 goal of 100% RSPO-certified palm oil, and owns 200,000 hectares of oil palm plantation area across six Indian states.

Recognizing Ruchi Soya's strong position in the Indian market, several global companies have expressed interest in a full or minority stake in the company. Malaysia's Sime Darby, Indonesia's Musim Mas and U.S.-based Cargill and Archer Daniels Midland have all submitted statements of interest in Ruchi. Within India, palm oil importers Adani Wilmar, Emami, and Patanjali Ayurved have also expressed interest. India is the largest importing country of both palm oil and soybean oil, both of which are widely used as cooking oils and in food products. Indonesia's exports of palm oil to India grew 32% to a record 7.6 million tons in 2017. India is seeking to expand domestic palm oil production to lessen reliance on imports.

Blockchain and cell-cultured meat are fast emerging as new technological developments that could impact the global meat industry. Blockchain technology, which involves verifiable and permanent data on transaction records, is already being tested in the Asian consumer market. Chinese E-commerce giant Alibaba plans to use the technology for quality control of New Zealand and Australian beef imports, and Australian startup Beef Ledger is developing a platform targeting Asia's expanding middle class. The platform will include provenance data and sale history, consumer feedback, and a streamlined payment system, all accessible through a QR code on packages of beef.

Another technology, cell-cultured meat, faces a longer road to general consumer acceptance but could appear in restaurants and grocery stores within 8 years. Recognizing its potentially viability, Cargill and Tyson Foods have made investments in a startup developing cell-cultured meat, and another startup plans to target the Brazilian domestic market with plant-based "alternative-meat" products. Some analysts see cell-cultured and plant-based meats as an avenue to satisfy rising global protein demand, rather than as a direct competitor to the international beef industry.

For more information contact Owen Hauck, Market Intelligence Analyst at WWF, at owen.hauck@wwfus.org.