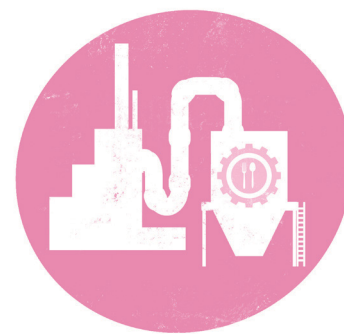


Food & beverage processing



Food & Beverage Processing: The food and beverage industry focuses on the post-harvest processing of raw agricultural commodities into consumer products – both foodstuffs and feedstuffs for human and animal consumption.

Overlapping Links in the Chain: The food and beverage (F&B) sector illustrates overlapping links in the industrial food chain: The world's top 10 food and drink companies (ranked by F&B sales) include two of the world's leading ag commodity traders (Cargill, Archer Daniels Midland²) and three of the world's top ranking meat companies (JBS, Cargill, Tyson). See sections on Agricultural Commodity Traders and Big Meat/Protein.

Leading Companies by Food & Beverage (F&B) Sales, 2020

| Rank | Company / Headquarters | F&B Sales, 2020 US\$ millions | Total Company Sales, 2020 US\$ millions |
|-------------------------------------|-----------------------------------|----------------------------------|--|
| 1. | Pepsico (USA) | 70,372 | 70,372 |
| 2. | Nestlé (Switzerland) | 67,708 | 79,114 |
| 3. | JBS (Brazil) | 50,690 | 52,467 |
| 4. | Anheuser-Busch InBev (Belgium) | 46,881 | 46,881 |
| 5. | Tyson Foods (USA) | 43,185 | 43,185 |
| 6. | Mars (USA) | 37,000 | 37,000 |
| 7. | Archer Daniels Midland Co (USA) | 35,395 | 64,355 |
| 8. | The Coca-Cola Co (USA) | 34,300 | 34,300 |
| 9. | Cargill (USA) | 32,375 | 114,600 |
| 10. | Danone (France) | 26,927 | 26,927 |
| Top 10 (F&B Sales only) | | 444,833 | |
| 11. | Mondelez (USA) | 26,581 | 26,581 |
| 12. | Kraft Heinz (USA) | 26,185 | 26,185 |
| 13. | Smithfield Foods/WH Group (China) | 24,463 | 25,589 |
| 14. | Olam International (Singapore) | 22,842 | 25,975 |
| 15. | Lactalis (France) | 22,755 | 22,755 |
| Top 100 (F&B sales only) | | 1,316,312 | |

Source: *Food Engineering Magazine*, September 2021: <https://www.foodengineeringmag.com/2021-top-100-food-beverage-companies>

Top Heavy:

- The F&B sales of each of the top 4 firms surpassed US\$45 billion in sales. Sales of the top 10 companies each surpassed US\$25 billion.
- The top 10 F&B behemoths collectively account for a US\$445 billion global market share, close to half a trillion dollars.³
- The F&B sales of the top 100 companies collectively exceed US\$1.3 trillion.⁴

Really Big Food: The world's top 10 F&B companies account for over one-third (34%) of the sales earned by the top 100 F&B companies worldwide (food & bev sales only). The world's top 4 F&B firms account for 18% of the sales posted by the top 100 companies in 2020.

Trends: chew on this

ETC finds:

- **Volatility and asymmetry**
- **Consolidation on the fast track**
- **Digital path to market power: closing in on the consumer**
- **Climate-driven techno-fixes**

Volatility: The uncertainty and economic upheaval spawned by Covid-19 are rattling every link in the industrial food chain. In 2021 F&B firms hiked product prices in response to labour shortages and soaring costs for raw materials, manufacturing, packaging and shipping.⁵ Supply chain seizures are confounding access to everything from computer chips to potato chips. In the absence of vigorous anti-trust regulations, some of the world's largest food companies are using the pandemic-induced supply chain gridlock as an excuse to raise prices. In other words, the problem isn't just supply chain chaos; it's corporate greed.⁶

Big Food's Under-Belly: According to FAO's 2021 report on hunger, moderate or severe food insecurity has been climbing for the past six years and now affects nearly one-third of the world population.⁷ In 2019, around 3 billion people could not afford healthy food due to spiralling food prices and pervasive income inequality.⁸ A record 193 million people faced acute food insecurity in 2021, even before the outbreak of Russia's war in Ukraine.⁹

Consolidation on the Fast Track: The global pandemic hasn't diminished the F&B sector's appetite for mergers and acquisitions (M&A). 2020 saw a 36% increase in the number of M&A deals – totaling US\$110 billion – compared to a 10% drop in the number of deals in 2019.¹⁰ Big Food & Beverage deals include:

2021:

- International Flavors & Fragrances seal the deal on a US\$26.2 billion megamerger with DuPont’s Nutrition & Biosciences division, creating a food ingredient powerhouse worth US\$45.4 billion.¹¹
- PepsiCo agrees to sell its controlling stake in Tropicana and Naked Juice brands to French private equity firm PAI Partners for US\$3.3 billion.
- Hormel Foods acquires Kraft Heinz’s snack-nut business (Planters Peanuts) for US\$3.3 billion.
- Coca-Cola announces its biggest-ever acquisition: a US\$5.6 billion deal to acquire full control of BodyArmor sports drink.

2020:

- Coca-Cola bottlers/distributors in Europe (CCEP) swallow Australian Coca-Cola bottler, Amatil, for US\$6.6 billion.
- PepsiCo gulps down Rockstar (energy drink) for US\$3.8 billion.
- Lactalis, the world’s largest dairy, buys natural and specialty cheese business from Kraft Heinz for US\$3.2 billion.
- Beer behemoth, AB InBev, sells its Australian subsidiary to Asahi Group Holdings (Japan) for US\$11 billion.

2019:

- Froneri joint venture buys Nestlé’s US ice cream business for US\$4 billion.
- Investment firm KKR swallows the international operations of Campbell Soup Co for US\$2.2 billion.

Big Food’s Digital Quest: Closing in on the Consumer

Big Food is vying to become “consumer-centric.”¹² With many customers eating, working, playing and staying at home, F&B manufacturers aren’t content to sit back and watch giant food retailers dominate e-commerce. Instead of allowing its big brand products to sit passively on the grocer’s shelf, F&B industry giants are increasing investment in digital tech and mining “customer data platforms.”¹³ For example:

- AB/InBev, the titanic brewer that sells about one-third of the world’s beer, is hawking and delivering beer with its BEES B2B e-commerce platform, BeerHawk.co.uk and Zé Delivery platform (Brazil). CEO Carlos Brito says, “We are now more closely connected than ever to the 6 million+ customers and 2 billion+ consumers we serve worldwide through our clear commercial strategy, our revamped innovation process, digital platforms and our ongoing operational excellence.”¹⁴
- Nestlé is adding to its “dietary management” and “personalized nutrition” portfolio with, for example, the recent US\$2.6 billion acquisition of bio-pharma firm and peanut-allergy treatment maker, Aimmune. In 2020, Nestlé also acquired Freshly, a “healthy” meal delivery services firm, for US\$950 million. Both acquisitions aim to forge direct links to

the consumer, exploit the overlap between food and nutrition and amplify the digital path to market power.

- With the onset of Covid-19, PepsiCo took just 30 days to launch its direct-to-consumer platforms, Snacks.com and PantryShop.com

F & B Trends: Products perceived as “healthy” and “good-for-you” continue to be M&A “targets of choice” for the F&B industry, according to *Financial Times*.¹⁵ So-called “performance nutrition” and low-sugar options are among them: For example:

- PepsiCo is selling its controlling stake in sugary-drinks Tropicana and Naked Juice brands for US\$3.3bn in order to focus on calorie-free beverages and energy drinks.¹⁶
- Nestlé is in talks to buy the maker of Nature’s Bounty vitamins and minerals, a multi-billion deal that seeks to bolster its “wellbeing” portfolio.¹⁷
- Even once-dominant sugar titan Tate & Lyle plans to shed its controlling interest in bulk sweeteners.¹⁸

Climate-Driven Techno-Fixes:

The seismic shocks of climate chaos promise far greater disruption than the global covid pandemic, and in addition food systems account for more than one third of global greenhouse gas emissions.¹⁹ In hot pursuit of “green haloes,” industrial food giants are rolling out ambitious sustainability pledges to “decarbonize” their business models in myriad ways – from embracing “regenerative agriculture” and “carbon-footprint” product labeling, to genetic tinkering and geo-engineering.

Regenerative Agriculture: Climate-Friendly or Business as Usual?

Many of the world’s largest food & beverage corporations are pledging to achieve “net zero” carbon emissions in the next two decades by supporting “regenerative farming,” a shape-shifting term without a standard definition. Industry proponents include PepsiCo, Unilever, Cargill, Nestlé, General Mills, JBS and private equity firms, among others. In some cases, *regenerative farming* may include practices such as cover cropping, reduced tillage, and crop rotation, or the collection of on-farm data to assess the impact of these practices. But the term is now used so indiscriminately by some corporations that it may even refer to the use of pesticides and GMOs in monoculture cropping when combined with livestock production.²⁰

According to Nestlé, two thirds of its greenhouse gas emissions come from agriculture and to reach its ambitious climate goals, it plans to funnel US\$1.3 billion by 2025 into regenerative agriculture across its supply chain.²¹ Cargill and General Mills pledge to push regenerative agriculture practices across 10 million acres²² of farmland and 1 million

acres of farmland²³ by 2030, respectively; PepsiCo plans to spread regenerative farming practices across 7 million acres by the same year.²⁴ In 2019, 19 food and agriculture-related companies – including Kellogg Company, DSM, McCain Foods, Nestlé, Unilever, Yara – and the World Council for Sustainable Development formed the “One Planet Business for Biodiversity” partnership, ostensibly to “protect and restore biodiversity within their supply chains and product portfolios.”²⁵ “Scaling up regenerative agriculture practices to protect soil health” is a central focus.²⁶ The Food and Land Use Coalition (FOLU), a key architect of the UN Food Systems Summit, is a corporate lobby group (funded by Yara and Unilever) masquerading as a think tank.²⁷ FOLU advocates the use of digital technologies and GMOs to scale regenerative agriculture to “transform food and land use.”²⁸ Critics point out that it does nothing to address profound inequities in access to land and land rights.²⁹

In the absence of a universal standard for regenerative agriculture, Big Food & Ag is directing investments to data-fuelled digital agriculture projects, soil carbon measurement initiatives, including establishing carbon marketplaces and promoting farming practices like no-till. Cargill’s “RegenConnect” program, which pays farmers on the basis of soil health and environmental outcomes, includes payment per metric ton of carbon sequestered.³⁰ Cargill partners with a carbon measurement firm Regrow, which uses in-field data, remote sensing and crop and soil health modelling to measure soil carbon.³¹ These offsets are then sold to corporations, which can tout their climate-saving bonafides without having to make material changes to their polluting operations. Cargill itself bought carbon offsets from its RegenConnect farmers.^{32, 33} Similarly, the Bayer Carbon Program pays growers for implementing “carbon-smart” practices like no-till, strip-till and cover crops for sequestering carbon in the soil, including the cultivation of GMO crops.³⁴

Promoting soil carbon sequestration as a reliable climate mitigation tool seems particularly specious in light of recent research that finds the potential of soil to soak up carbon has likely been overestimated.³⁵ JBS, which committed to invest US\$100 million by 2030 to strengthen and scale regenerative farming practices, including carbon sequestration and on-farm emission mitigation technologies,³⁶ actually *increased* its emissions by 51% between 2016 to 2021.³⁷

Lofty pledges to slash greenhouse gas emissions often exclude supply chains and consumer waste, and involve murky accounting.³⁸ Recent in-depth reports from civil society organizations are revealing corporate greenwashing and fraudulent climate pledges.³⁹ The bottom line, according to Friends of the Earth International: “‘Greenwashing’ hardly suffices as a term to describe these efforts to obscure continued growth in fossil emissions – ‘ecocide’ and ‘genocide’ more accurately capture the impacts the world will face.”⁴⁰

“The big myth in the corporate sustainability world is the idea of ‘win-win’ — that a company can maximize profits and still stay environmentally friendly... We have 30 years of data that we can look at and say that doesn’t work.” Roland Geyer, professor of industrial ecology at the University of California, Santa Barbara⁴¹

Monetizing Brand “Sustainability”: Unilever (a “Principal Partner” for the UN 2021 climate summit in Glasgow) and maker of 75,000 products is testing carbon-footprint labelling on its products, and is also proposing the idea of “carbon-friendly” aisles in supermarkets.⁴² Carbon labelling is designed to appeal to climate-conscious consumers, but it also feeds the false notion that personal choices tied to consumption, rather than systemic changes, are the best way to cut emissions from greenhouse gases. Meanwhile, a 2021 report by Break Free from Plastic reveals that Unilever was #3 (after Coca-Cola and PepsiCo) on the list of the world’s Top 10 Corporate Plastic Polluters.⁴³ (The data was collected from over 11,000 volunteers who conducted 440 brand audits in 45 countries.) Not surprisingly, the top 10 corporate plastic polluters include six of the companies appearing on our list of the world’s 15 largest food and beverage firms.⁴⁴

ADM: Geoengineer to the World? In April 2021 Archer Daniels Midland declared that its Illinois-based experiment had successfully captured and stored one million metric tons of carbon dioxide (CO₂) over a period of three years.⁴⁵ Carbon capture and storage (CCS) refers to the mechanical capture of CO₂ emissions from power plants or other industrial sources; ADM is injecting CO₂ emissions from its coal-fired, corn-based ethanol processing plant more than 6,500 feet underground. Carbon capture is a lucrative source of corporate welfare for ADM. Since 2017 the US government has granted over US\$280 million to support ADM’s experiment,⁴⁶ and the company stands to receive tax credits of US\$20 per metric ton of carbon stored underground.⁴⁷ Critics point out that carbon capture and storage is itself an inefficient and energy-intensive process that sustains the fossil fuel industry.⁴⁸ Although ADM’s CO₂ storage is meant to be permanent, no one really knows if the captured CO₂ will stay underground, taint soil or groundwater, or cause seismic activity.⁴⁹

Climate-Driven Supply Chain Disruption: When it comes to Big Food’s dependence on traditional export commodities from the global South, the food and beverage sector is following its business-as-usual instincts: to secure raw materials inputs at lower costs and dodge geo-political unrest. The quest for cheaper raw materials and input substitution is nothing new, but investment in climate-driven techno-fixes is heating up. Two examples:

Chocolate-Covered Techno-Fix? Cargill, one of the world’s largest buyers of cocoa beans, is partnering with AeroFarms (New Jersey) to secure future cocoa bean supplies in the face of climate change⁵⁰ – presumably without soil or the 5 million farming households that depend on cocoa as a cash crop.⁵¹ Details are sparse, but AeroFarms specializes in “controlled environment agriculture,” vertical farming and “soilless growth media.” The company prides itself in being “able to disrupt traditional supply chains.”⁵²

Wake Up and Smell the Petri-Beans: With climate chaos threatening the sustainability of future coffee harvests, the food industry is betting that bio-reactor-brewed petri-beans may be in your future. Coffee is harvested on an estimated 12.5 million farms worldwide, of which 67–80% are smallholder farms in the global South.⁵³ In September 2021 researchers at the VTT Technical Research Centre of Finland announced they had sipped the world’s first lab-grown coffee.⁵⁴ Using synthetic biology, researchers coaxed engineered microbes and coffee plant cells to brew in bioreactors. Despite a lukewarm review of its aroma and taste (“...our trained sensory panel...found the profile of the brew to bear similarity to ordinary coffee”), lead researcher Heiko Rischer optimistically forecasts that his lab is “only four years away from ramping up production and having regulatory approval in place” for synbio-brewed coffee.⁵⁵ California-based synthetic biology start-up, Compound Foods, is also pioneering the development of a “beanless coffee.”⁵⁶

What is Synthetic Biology? Synthetic biology brings together engineering and the life sciences in order to design and construct new biological parts, devices and systems that do not exist in the natural world or to tweak the designs of existing biological systems. Synthetic biologists, engaged in a kind of extreme genetic engineering, hope to construct designer organisms that perform specific tasks such as producing biofuels or other high-value compounds.

Notes

- 1 Food revenue is only about 28% of Cargill's total revenue.
- 2 Food revenue accounts for about 55% of ADM's total revenue.
- 3 The top 100 food & beverage companies (food & beverage sales only) collectively account for a global market of US\$1,316,312 million. The information was gleaned from *Food Engineering Magazine's* database. Source: *Food Engineering Magazine*, September 2021: <https://www.foodengineeringmag.com/2021-top-100-food-beverage-companies>.
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