BUTCHERING THE PLANET

The big-name financiers bankrolling livestock corporations and climate change

FEED BACK

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GLOSSARY

AGRICULTURAL AND ENVIRONMENTAL TERMS

Carbon dioxide equivalent (CO2-eq)

A metric measure used to compare the emissions from various greenhouse gases by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

Concentrated animal feeding operation (CAFO)

A form of intensive animal agriculture where animals are contained or confined for more than 45 days in 12 months, and the number of animals is more than 125,000 broiler chickens, 82,000 laying hens, 2,500 pigs, 700 dairy cattle or 1,000 beef cattle.

Industrial (animal) agriculture

A type of agriculture, both of crops and of animals, with high levels of input and output per unit of agricultural land area. A full definition can be found in the report 'It's Big Livestock Versus the Planet'[1].

Intensive animal agriculture

Often used as a synonym for industrial animal agriculture but tends to also refer to containing or confining animals. In the UK, livestock farms are classified as 'intensive' by the Environment Agency when they contain more than 40,000 birds, 2,000 pigs or 750 breeding sows.

Scope (Emissions)

For businesses, emissions are usually split into three categories ('Scopes'). Scope 1 emissions come from in-house operations like company vehicles and gas boilers. Scope 2 emissions come from the energy purchased and used by the company. Scope 3 emissions come from activities within a company's supply chain. This scope covers the fertiliser used in producing animal feed and the methane and manure emissions from the animals themselves. For a meat and dairy company, Scope 3 emissions can be up to 90% of their footprint[2].

FINANCIAL TERMS

The financial institutions in this report provide financial support in three broad ways to Big Livestock:

Investment: Shares and bonds

Financial institutions invest in the equity and debt of a company by holding shares and/or bonds. Institutional investors (such as banks, insurance companies, pension funds and asset managers) can, through the funds they are managing, buy shares of a certain company, making them part-owners of the company. Institutional investors can also buy bonds – which are best described as a large loan cut up into separate pieces, which are then sold. The main difference between owning shares and bonds is that the owner of a bond is not a co-owner of the company; the owner is a creditor of the company. The buyer of each bond is entitled to repayment after a certain number of years, and to a certain interest during each of these years. Both shares and bonds are traded on stock exchanges.

Banking

When a financial institution provides credit, it can be through a loan, or through a revolving credit facility (which operates a bit like a credit card).

Investment Banking

Investment banks earn fee income for advising and arranging things such as mergers, bond issues, securitisation, etc. One important activity they carry out is the underwriting of bond or share issues. An underwriter promotes the shares and finds shareholders – in effect buying with the intention of selling to investors.

INTRODUCTION

Cattle-driven deforestation in the Amazon. Modified Copernicus Sentinel data (2017), SentinelHub

Meat and dairy are a climate issue. But from the scale of investments made by the biggest global financial institutions, all with high-level and public commitments to sustainability, you wouldn't know it.

Between 2015 and 2020, global meat and dairy companies received over $478 billion in backing by over 2,500 investment firms, banks, and pension funds headquartered around the globe. High street British banks such as Barclays and HSBC provide billions in loans to the firms behind chlorinated chicken. Prestigious universities, which have banned beef on campus, continue to fund controversial Brazilian butchers through their college endowments[a]. And pension, savings and investment companies such as Prudential, Standard Life Aberdeen and Legal & General invest in companies such as JBS and Marfrig, linked again and again to deforestation.[14]

From farm to fork, the food system generates 25–30% of global greenhouse gas (GHG) emissions[3], but while capital markets are starting to wake up to the risks of climate change and taking steps to tackle these emissions from fossil fuels, emissions from food and agriculture remain largely unaddressed.

a Feedback, forthcoming

Feedback's research shows that in April 2020, 3,000 investors backed the world's thirty-five largest[b] meat and dairy corporations to the tune of $228 billion dollars. Despite meat and dairy representing less than 1% of total assets under their management, through their sheer size, Blackrock, Capital Group and Vanguard are meat and dairy corporations' largest shareholders. Allianz joins Blackrock and Vanguard to round out the top three bondholders. A quarter of bonds held have a maturity of over 10 years. Given to the sector's inability to meaningfully decarbonise[1,2] and what the UN Principles for Responsible Investment terms the 'inevitable' policy response, these look like assets at risk.

Loans totalling $167 billion flowed from over 200 banks to the world's thirty-five largest meat and dairy corporations, which together emit more than the economies of Germany, Canada or the UK[2]. Banks headquartered in the US, France and the UK provide over half (51%) of the credit to these meat and dairy giants, totalling $91.8 billion in loans and $45.9 billion in underwriting over the past five years, with BNP Paribas, Barclays and JP Morgan Chase the largest creditors.

Banks and investors that promote their sustainability policies, wearing commitments to end deforestation and combat climate change with pride, are deeply implicated in the financial support offered to the global livestock industry. Despite decades of action on climate and supply chains, only 6 of the 35 largest livestock companies have Scope 3 emissions targets[2]. High profile commitments on 'zero deforestation' will not just be missed – but missed by years[4]. The most common ask among investors when 'engaging with companies' isn't for concrete emissions reduction or to stop driving deforestation but for 'more reporting'[5].

Occasionally, the hypocrisy is even more stinging – banks such as HSBC appear to be funding Brazilian beef linked to deforestation and forest fires, despite their own ethical investment policies forbidding them to do so. The investor Marshall Wace, which features their support during COVID-19 for local communities on the front page of their website, continues to invest in Tyson Foods, a company that has come under particular scrutiny for its conduct during the crisis[6,7]. And over the past five years, Rabobank – which 'focuses explicitly on sustainability in livestock farming' – has loaned $5.7 billion to meat and dairy companies with a combined emissions footprint of 727 million tonnes of CO_2-eq a year, including WH Group, which scored 0 out of 100 on Global Canopy's influential Forest 500 sustainability ranking[4].

Feedback's investigation exposes the sheer scale of the global financial fodder behind meat and dairy corporations and reveals how high street banks, global investors and pension funds are bankrolling destructive livestock corporations. **Our argument is simple: engagement is failing[1].** Damage is already being done to local communities, workers, the planet and investors' money. It is time to defund, and to divest from, Big Livestock.

b Largest by production volume. Calculated by taking the 10 largest cattle, poultry, hog and dairy producers and combining these lists, following IATP & GRAIN (2018)[2]. Some companies appear on multiple lists, resulting in 35 companies in total.

WHY BIG LIVESTOCK MATTERS FOR CLIMATE GOALS

The climate impacts of the world's largest meat and dairy corporations – Big Livestock – could soon rival that of the oil giants, Big Oil. The five largest Big Livestock industry players – JBS, Tyson, Cargill, Dairy Farmers of America and Fonterra – together emit more GHGs than ExxonMobil[2].

With business-as-usual, the industry's growth will rapidly breach the global 1.5°C[8] carbon budget. Within 10 years, the livestock sector will account for almost half (49%) of the world's emissions budget for 1.5°C by 2030[9] and 80% by 2050[2], requiring other sectors to slash their emissions more than is feasible to avert catastrophic levels of warming. To meet the steep and rapid reductions in GHG emissions necessary to achieve the goals of the Paris Agreement, global livestock numbers need to fall, and substantially so. We have reached 'peak livestock'[9].

Peak livestock has existential implications for Big Livestock. Headquartered in regions producing 'surplus' protein[2], these corporations are locking the world into a future dominated by ultra-high impact, industrially produced meat and dairy – a world of catastrophic warming.

But the risks extend well beyond climate[1,10,11]: These corporations have huge impacts on the communities and ecologies where they operate, from 30,427 workers across 262 American slaughterhouses who have caught coronavirus and the 113 who have lost their lives[c,12], to beef companies driving deforestation and exacerbating inequalities in the Amazon[13]. This year the attention of investors and legislators is being increasingly drawn to these issues[d] – as US senators launch anti-trust and COVID-19 probes into Tyson, Smithfield and JBS[6] and as the annual fire season begins to move from a smoulder to a blaze.

New York City council member Eric Adams calls for a ban on the Big Livestock companies tied to the Amazon Wildfires. Pacific Press Agency / Alamy

c This is an issue not only confined to the US – Tönnies.

d See for example: Feedback's report, 'It's Big Livestock Versus the Planet'[1]; 'The Farm Animal Risk and Return Index' (FAIRR)[10]; 'Complicity In Destruction', by Amazon Watch[13]; and 'Money to Burn', by Global Witness[14].

METHODOLOGY

Aerial shot of whole feedlot. B Brown

Feedback commissioned research firm Profundo[e] to map the financial backers of the world's thirty-five largest meat and dairy companies. Through Bloomberg and Refinitiv databases, and through company reports, our investigation reveals the scale of finance underpinning global industrial animal agriculture[f].

From cattle ranchers clearing land by fire at the Amazon forest frontier[14], to multi-storey 'hog hotels' in China with thousands of breeding sows[15], to poultry slaughterhouses in America where the workers describe themselves as 'modern slaves'[16], we name the bankers and investors providing livestock's corporations with finance. This report only scratches the surface of the data collected, and due to the secrecy of the sector our dataset is not itself exhaustive. But for now, we start with the big picture, before diving into two case studies: beef and chicken.

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e https://www.profundo.nl/en/.

f See Annex two for more details about our methods

THE ROLE OF FINANCE

Thus far, global finance has not used its leverage to address the climate burden posed by industrial animal agriculture.

Not one of the 250 global exchanges mandates Scope 1, Scope 2 or Scope 3 GHG reporting for companies' food, forestry and land-use activities. In 2019 when $3.83 trillion in syndicated loans were issued, we identified no 'green' loans to livestock companies with GHG emissions targets. A single 'transition bond' was issued, for beef producer Marfrig, which has been widely criticised for its lack of ambition and dubious green credentials[17]. None of the 20 largest providers of credit and investment to Big Livestock identified in this research have a publicly available, target-driven policy on agriculture, land-use and forestry. Fourteen members of the influential Net-Zero Asset Owners Alliance[g] together hold $5 billion in bonds and shares of impossible to de-carbonise[h] industrial meat and dairy – a potential challenge for their net-zero targets. And in another recent review by ShareAction covering 75 of the largest asset managers, only three mentioned agriculture as a sustainable investment opportunity[5]. Food, including livestock, appears to be a sustainable finance blind-spot.

The 35 companies in this report (see Annex 1), together emit more than the economies of Germany, the UK or France and egregiously underreport their emissions[2]. Thirteen of them feature on the Farm Animal Risk and Return Index (FAIRR), which classifies protein producers across a whole range of risks, including human rights, climate and antimicrobial resistance. A total of $11.4 billion is invested in companies categorised as high-risk[i], led by Mondrian Investment Partners (which holds a 5% stake in the pork giant WH Group) and $45.5 billion is invested in medium risk[j] companies. None of the 13 meat and dairy companies that feature in this report and in the FAIRR index are categorised by FAIRR as being low-risk.

The 15 largest investors and creditors in meat and dairy appear in Figures 1 and 2. While the big picture alone is deeply troubling, it is the detail that matters. Let's consider the example of cattle ranches in the Brazilian Amazon, before moving to US poultry slaughterhouses.

Climate protestors outside Blackrock's New York headquarters. Steve Sanchez

A NOTE ON PUBLIC FINANCE INSTITUTIONS

The loans made by public development finance institutions (DFI) such as the Multilateral Development Banks fell outside the scope of this work. But the issues outlined in this report are remarkably similar. A recent investigation by The Bureau of Investigative Journalism highlighted the $2.6 billion of financing from the European Bank of Reconstruction and Development and the International Finance Corporation (IFC) went to support controversial 'mega-farm' style production in regions with high per-capita meat consumption – not to sustainable, climate-resilient and agroecological production[18]. The level of environmental ambition can at times best be described as farcical: for example, the IFC's loans to Brazilian agriprocessors, such as Minerva, simply attempted to bring firms and suppliers into compliance with existing Brazilian environmental law[19].

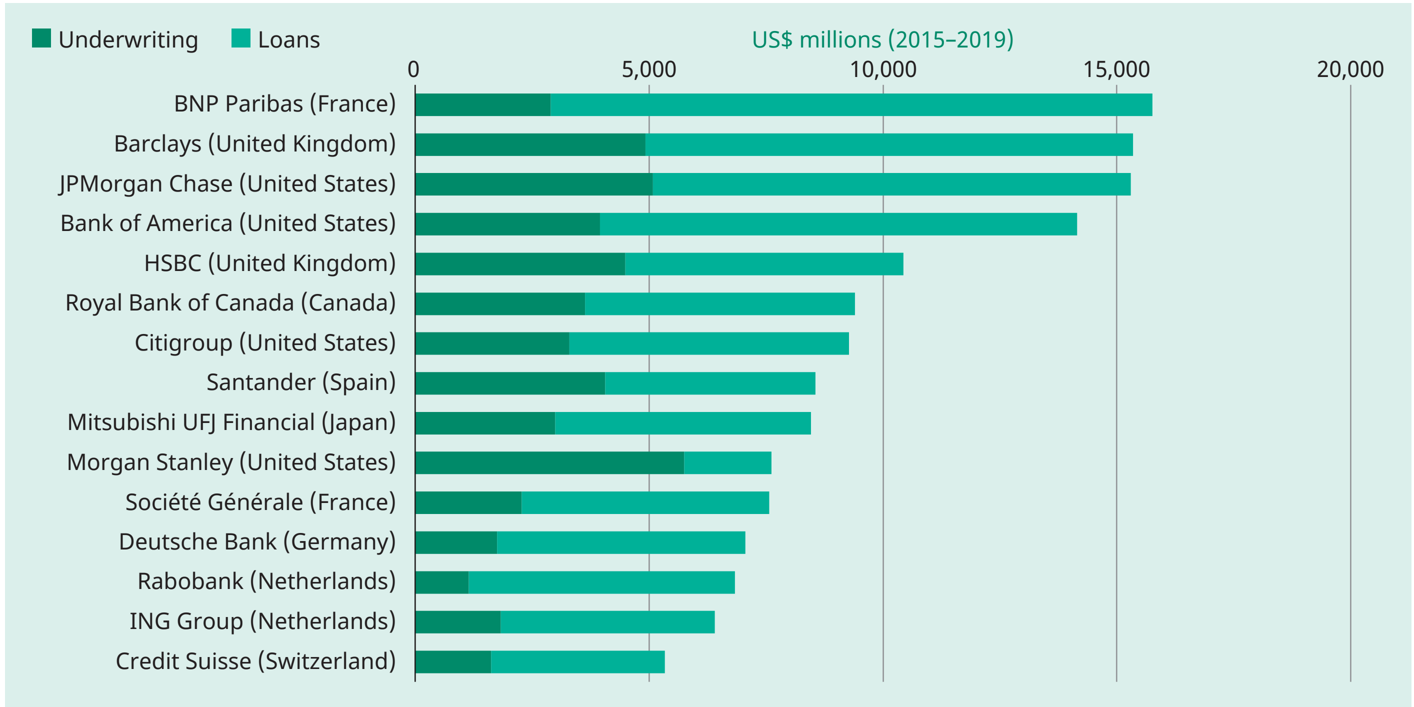
g Committed to net-zero portfolios by 2050, 26 members in total.

h For a detailed overview on why industrial meat and dairy companies cannot meaningfully reduce their emissions see our report, 'It's Big Livestock Versus the Planet'[1].

i The high-risk companies are WH Group, Minerva, NH Foods, New Hope, Guangdong Wens Foodstuff Group (now named Wens Foodstuff Group) and Industrias Bachoco.

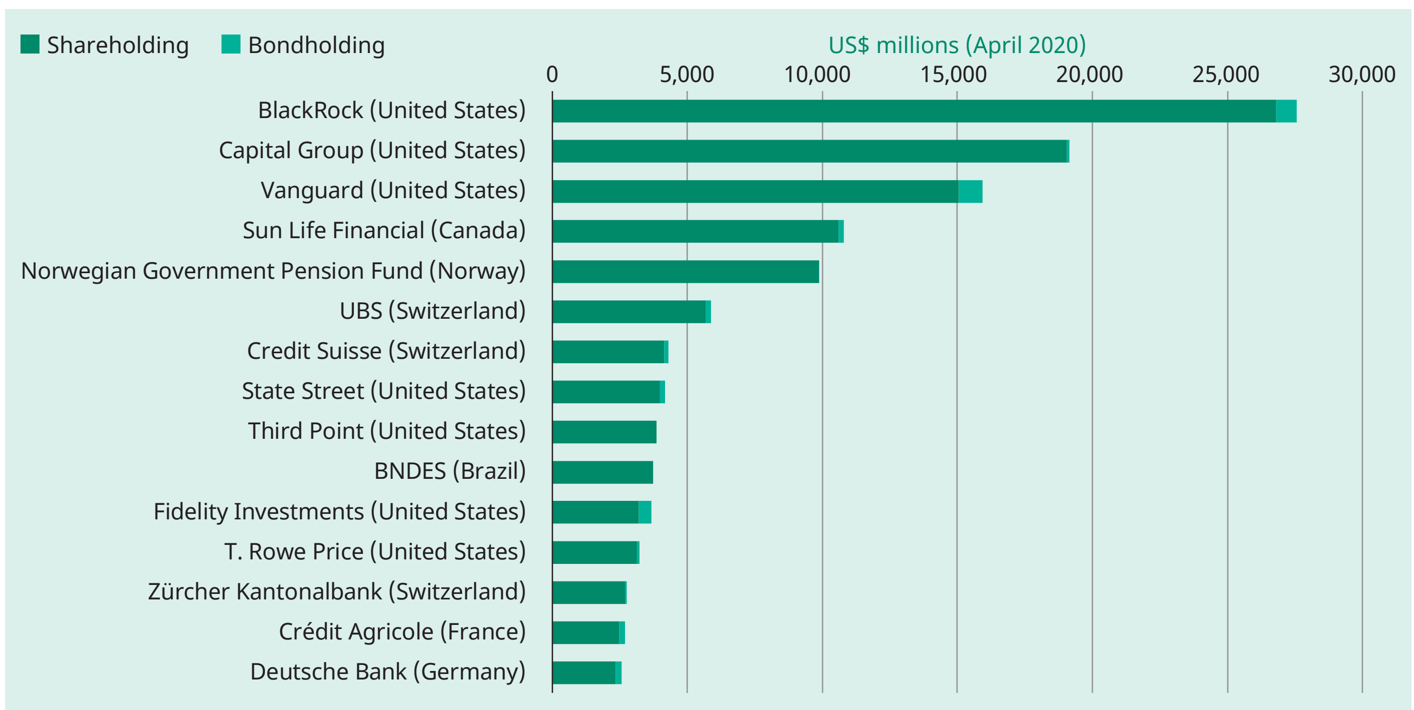
j The medium-risk comapnies are Fonterra, Tyson, Marfrig, Hormel, BRF, Charoen Pokphand, JBS.

Figure 1: The biggest creditors to meat and dairy



Source: Thomson EIKON (2020, May), Loans; Bloomberg (2020, May), Loans; Thomson EIKON (2020, May), Bond Issuances; Bloomberg (2020, May), Bond Issuances; Thomson EIKON (2020, May), Share Issuances; Bloomberg (2020, May), Share Issuances; Bloomberg (2020, March), Loan Search; IJGlobal (2020, May), Transactions search; Trade Finance Analytics (2020, May), Transactions search; Company reports; and media search.

Figure 2: The biggest investors in meat and dairy



Source: Thomson EIKON (2020, May), EMAXX: Bondholders; Thomson EIKON (2020, May), Shareholdings; Thomson EIKON (2020, May), Bond Issuances; Bloomberg (2020, May), Bond Issuances.

BRAZILIAN BUTCHERS AND THE AMAZON FIRES

Amazon fire. iStock Getty Images

Whether through statements on the forest fires, or on soy (feed) supply chains – investors often want to be seen acting on deforestation and the Brazilian Amazon.

Whether these statements have substance remains to be seen: out of the 244 investors who signed onto the 'Investor statement on deforestation and forest fires in the Amazon' only seven had policies on deforestation[1]. But investor rhetoric is escalating, and for the first time the threat of divestment is on the table. This year, as the Amazon fire season gets underway, for the first time, Nordea, Legal & General and others have threatened divestment of Brazilian meat, grain, and oilseed companies, citing a lack of progress on climate and forest issues[20]. Legal & General are engaging with JBS, Minerva and Marfrig – three Brazilian meat giants with a decade-long track record of breaking deforestation agreements[13,14] – and looking for 'robust climate targets and land-use policies, with inaction potentially leading to voting sanctions and targeted divestments'[20]. **For now, the talk remains on targets, not action, on policies, not progress.**

Since 2015, 58 banks have provided $10.6 billion in loans and $16.1 billion in underwriting to JBS, Minerva and Marfrig. Barclays, Bradesco, Royal Bank of Canada, Banco de Brazil and Santander led this financial flood – together providing almost half of the total loans and underwriting. The three largest lenders, Barclays, the Royal Bank of Canada and Rabobank, provided slightly over half the total loan volume ($5.6 billion). The volumes of investment finance are also substantial: 448 investors have $37 billion invested in JBS, Marfrig and Minerva.

Zooming in on a few individual banks reveals a picture of vague policies without clear criteria. But in some cases, even these vague policies appear to be broken. To take one example," HSBC's 'Agricultural Commodities Policy'[21] states it will not provide financial services to customers involved directly in or sourcing from suppliers involved in either deforestation or land clearance by burning. But a report earlier this year, yet again, linked the Brazilian meat companies JBS, Marfrig

and Minerva to purchases of thousands of cattle linked to deforestation of the Amazon[22]. Over the last five years HSBC has loaned Marfrig and Minerva over $1.8 billion and as of April 2020 held shares to the tune of $9 million in JBS.

This is a pattern mimicked throughout the banking sector. BNP Paribas boasts of its commitment to net-zero deforestation through the 'Soft Commodities Compact'[23] – a voluntary banking initiative aiming to transform soft commodity supply chains to support net-zero deforestation supply chains by 2020. So it is somewhat surprising it bought into Marfrig's spin, running the books for a so-called 'sustainable transition bond'[k] – albeit following some internal tension around the reputational risk[24]. This money-raiser paid Marfrig to buy cattle from suppliers in the Amazon region who are part of an internal 'sustainability initiative'[25]. The bond does not focus on the main challenges to Marfrig's sustainability: its emissions footprint and poor monitoring of its indirect supply chain. Perhaps mindful of this, the sales brochure for the bond admits: 'There is currently no market consensus on what precise attributes are required for a particular project to be defined as 'sustainable,' and no assurance can be provided that the use of the net proceeds ... will satisfy [those conditions]'[24]. It is unsurprising then that earlier this year, Greenpeace accused Marfrig of continuing in a problematic practice: badly monitoring its high deforestation risk indirect suppliers[22]. BNP Paribas's 'Responsible Business Conduct Policy' also states that companies it lends to should 'put in place measures to monitor and reduce GHG emissions including CO_2 (carbon dioxide) and CH_4 (methane)'[26], missing a key agricultural GHG – nitrous oxide. Additionally, BNP Paribas' clients include BRF, WH Group and Cargill – companies that do not account for the bulk of their emissions, with only partial reporting of their Scope 3 emissions[2].

For asset managers the picture is similar. Storebrand has 'an ambition to exit companies that contribute to deforestation by 2025', which may include its investment in WH Group, a company that received a score of 0/100 on Global Canopy's influential deforestation ranking, the Forest 500[4]. And out of the 244 investors who signed onto the 'Investor statement on deforestation and forest fires in the Amazon' only seven had publicly available policies on deforestation[27]. Specific examples of hypocrisy abound: Janus Henderson, which in its 2018 annual report on one of its sustainable indices states that 'it is important to avoid investing in companies whose products and services impact the environment or society negatively and which are contrary to the UN SDGs. For this reason, we have made a conscious decision to avoid direct investments in [...] meat and dairy production'. As of April 2020, Janus Henderson held $738 million in meat and dairy shares.

But the Brazilian beef companies have other issues beyond their deforestation risks. JBS has the largest climate footprint of any meat company in the world, with independent calculations suggesting that in 2016 its emissions rivalled Taiwan's at 280 million tonnes of CO_2-eq. JBS reported just 8.9 million[2]. In 2020 JBS, Minerva and Marfrig continue to not properly report Scope 3 emissions. Cattle, as Barclay's bank acknowledges, are responsible for 9% of human induced GHG emissions[28]. Barclay's is the largest provider of loans and underwriting to beef and dairy companies[l] identified in this research.

k 10 other banks were involved in the bond, including Santander and ING. For more info see reference 24.

l Barclay's has provided loans or underwriting for the following companies with significant beef or dairy interests JBS, Tyson, Nestlé, Cargill, Hormel and Danone.

(CHLORINATED) CHICKEN FEED

THE UK INVESTORS BACKING US LIVESTOCK CORPORATIONS

Industrial poultry shed. David Tadevosian

The US leads the world in intensive animal farming. Across the US there are over 50,000 concentrated animal feeding operations (CAFOs), and an additional quarter of a million industrial-scale facilities. Initially sold to the world as a marvel of innovation and progress, industrial production now dominates global meat production – providing cheap meat in return for a huge societal cost. Together, the US companies in this report emit as 346.7 million tonnes of CO_2-eq annually and US factory farming's long track record of devastating local communities and ecologies is well documented[1,29].

Ask anyone in the UK about US factory farming and one image will jump immediately to mind: chlorine-washed chicken[m], now synonymous with a post-Brexit trade deal. US lobbyists for agricultural corporations are pushing hard to stock UK shelves with their companies' meats[30] – to do so they need to remove barriers – such as the EU and UK's current ban on the use of growth hormones in beef, and on chlorine washing chicken. As of writing, over 1,000,000 people have signed a petition – championed by the National Farmers' Union – calling to protect UK food standards from US agriculture[31].

But while the UK public has very little appetite for chlorine-washed chicken, its banks and investors see the lucrative potential of American meat and dairy. Barclays, HSBC, Standard Chartered, NatWest and Lloyds provided loans and

m Banned by the EU in 1997, disinfectant washes such as chlorine are common in US agriculture to prevent salmonella. The European and UK approach instead focuses on maintaining high production standards instead.

underwriting totalling almost $12 billion between 2015 and 2019, and 36 UK investors led by Legal & General, Prudential and Janus Henderson together have $1.1 billion dollars in shares in Tyson, Hormel and Pilgrim's Pride[n]. Two of the UK's biggest pensions funds, the Universities' Superannuation Scheme and the Railways Pension Scheme – their members may be horrified to discover – invest in spam producer Hormel.

The UK imports roughly 60% of its pork[32], 40% of its poultry[33] and 25% of its beef[34]. The total value of these meat imports in 2018 was £6.8 billion, with the majority coming from the EU. Whether sow stalls for pigs, additives like Ractopamine, or growth hormones for cattle and pigs, US producers have an arsenal of practices that enable them to produce meat that is vastly cheaper than in the UK. This will potentially enable them, depending on the outcomes of the trade agreement negotiations, to take a huge bite out of the UK import market and, farmers fear, UK domestic production too[35].

As the trade deal intensifies, there are looming ESG (environmental, social and governance) questions for investors and lenders. Take, for example, Barclay's, which boasts it is 'Supporting UK Farming', helping farmers and growers thrive and to grow their businesses. This may be true, but Barclays is also a prolific funder of US agribusiness, providing an estimated $5 billion since 2015 in loans and underwriting to Tyson Foods, Cargill and others.

THE COST OF CORONA: A TASTE OF WHAT IS TO COME?

Since April, the Food and Environment Reporting Network has counted over 30,427 COVID-19 cases and 113 deaths among food-system workers – the vast majority working in slaughterhouses[12]. Data irregularities, including the industry's reticence to share data, mean the true count is likely higher[36] – particularly with outbreaks in slaughterhouses in Germany, Brazil, Ireland and the UK[37]. After a plea from Tyson Food's CEO in major national newspapers about a 'breaking supply chain', slaughterhouses were 'ordered' to stay open by the US president, and their workers classified as essential[38]. But rather than 'essential' it appears that workers are being treated as if they were expendable[39].

Systemic supply chain failures will cost the US cattle industry $13.6 billion[40], and four of the largest meat firms have lost 25% of their value since the crisis started (compared to a market average of 9%)[41]. China has recently banned poultry imports from select Tyson foods factories citing coronavirus fears, potentially ushering in a new front in the US–China trade war[37]. Looking forward, FAIRR warns of huge costs for meat companies to pandemic-proof their business models: from biosecurity measures, to antibiotic stewardship[42]. And the Intergovernmental Panel on Climate Change (IPCC) warns that industrial livestock systems 'will suffer the most' from indirect climate change impacts[3] as rises in the costs of water, housing and transport, combined with extreme weather and feed price volatility, will dramatically increase uncertainty in production. As mega-bank Goldman Sachs puts it, the only commodity as precarious as oil is livestock.[o]

n This is a very conservative estimate excluding international groups with significant US presence (i.e. WH Group through its subsidiary Smithfield).

o As of April 2020 our research shows Goldman Sachs has $423 billion invested in beef and dairy companies included in this report.

CONCLUSION

We have reached peak livestock. Industrial meat and dairy production are utterly incompatible with a safe, ecologically sustainable life on earth. JBS, Cargill and Tyson are businesses as damaging to our planet as the fossil fuel industry. **There is no version of industrial animal agriculture that is compatible with climate justice and a zero-carbon future**.

This report has documented the vast flows of private finance that prop up this fundamentally extractive business model. If funders continue with business-as-usual, change is unlikely to occur at the pace required to meet the climate crisis.

Despite longstanding and excellent critiques of industrial agriculture, gains have been incremental and primarily focused on animal welfare. And as Feedback's research has documented, investor engagement approaches to meat and dairy are not equipped to handle the scale of the challenges: production growth will outstrip emissions efficiencies, offsetting is simply not an option, and there is no precedent for the wholesale transformation of a sector that would suggest that shifting meat and dairy companies to plant-based protein producers is on the table[1].

The stories we tell about meat, dairy and the climate have largely focused on individual diets. We should not downplay powerful individual actions, but instead put them in the context of a system designed to drive colossal levels of consumption of damagingly cheap meat and dairy. The relationship between individual action and structural change is not either/or – they are needed together. It is time we made this link clear for food, especially for meat and dairy. And time for investors and bankers to put their money where their mouth is and stop providing financial fodder to Big Livestock.

Workers cutting meat in a slaughterhouse. David Tadevosian

ANNEXES

ANNEX 1: MEAT AND DAIRY CORPORATIONS

Table 1: The thirty-five largest meat and dairy corporations, by production volume

Company	Headquartered	Type	Emissions (mt CO2-eq-yr)
JBS	Brazil	Public	280.0
Tyson Foods	USA	Public	118.1
Cargill	USA	Private	86.3
Dairy Farmers of America	USA	Public	52.2
Fonterra Co-operative Group	New Zealand	Public	41.5
National Beef Packing Company	USA	Private	41.5
Marfrig Global Foods	Brazil	Public	40.0
Minerva Foods	Brazil	Public	34.7
WH Group (Smithfield)	China / Hong Kong	Public	30.1
Le Groupe Lactalis	France	Private	23.9
BRF	Brazil	Public	23.1
Arla Foods	Denmark	Private	22.4
Nestlé	Switzerland	Public	22.1
FrieslandCampina	Netherlands	Private	19.9
Dean Foods	US	Public	19.1
Yili Group	China / Hong Kong	Public	18.1
Danish Crown	Denmark	Public	16.5
VION Food Group	Netherlands	Private	15.2
California Dairies*	US	Private	14.3
Saputo Inc.	Canada	Public	14.3
Danone	France	Public	14.3
DMK Deutsches Milchkontor	Germany	Private	12.3
New Hope Group	China	Public	12.2
Groupe Bigard	France	Public	10.2
Tönnies Lebensmittel**	Germany	Private	10.9
China Yurun Food Group Limited	China	Public	10.3
(Guangdong) Wens Foodstuff Group	China	Public	10.3
Nippon Ham Foods	Japan	Public	8.7
Hormel Foods Corporation	US	Public	8.1
Coren Group**	Spain	Private	6.7
Charoen Pokphand Group	Thailand	Public	6.3
ABP Food Group*	Ireland	Private	5.4
Perdue Farms	US	Private	3.7
Industrias Bachoco	Mexico	Public	3.7
Koch Foods	US	Private	3.4
Arab Company for Livestock Development (ACOLID)**	Saudi Arabia	Private	3.3

Companies within the scope of this report, ranked by emissions. Emissions calculated using FAO GLEAM 2.0 covering scopes 1–3, source IATP & GRAIN (2016).
**No financial data identified for the report focus period 2015–2020. ** No data identified between Jan 2011 and Dec 2019.*

ANNEX 2: METHODS

Feedback commissioned the not-for-profit research firm Profundo to map the financial backers of the thirty-five of the world's largest meat and dairy companies, as defined by production volume. These data came from IATP & Grain 2016 Emissions Impossible. Alongside the companies named in this report, Profundo mapped finance of the group level holding companies, group financing vehicles, and their relevant subsidiaries. The financial research utilised Refinitiv, Bloomberg, IJGlobal, Trade Finance Analytics, company publications, company registers and media archives to identify financial relationships. Only funding for the meat and dairy activities of these companies is included in this report.

This report covers loans and underwriting between January 2015 and December 2019, and unless otherwise stated, shareholdings and bondholdings relate to the most recent filing date, April 2020. A time series analysis for shares was also conducted, spanning from 2016 to 2020 and loan data from January 2011 to December 2014 were also collected – these are not used within this report.

The databases relied on for this research do not always include details on how individual banks contribute to a financial deal. For syndicated loans and underwriting, we include this information where possible. When this information is not available, we use a two-step method to calculate this amount drawing on the total value of a loan or issuance, as well as the number of banks involved.

In step one, a ratio of an institution's management fee to the management fees received by all institutions is calculated.

Participant's contribution: $\left(\frac{\textit{individual participant attributed fee}}{\textit{sum of all participants' attributed fees}} \times \textit{principal amount}\right)$

When the fee is unknown for one or more participants in a deal, a second method is used, called the 'bookratio'. This determines the commitment distribution of bookrunners and other managers.

Bookratio: $\frac{\textit{number of participants} - \textit{number of bookrunners}}{\textit{number of bookrunners}}$

Table 2 shows the commitment assigned to bookrunner groups with this estimation method. When the number of total participants in relation to the number of bookrunners increases, the share that is attributed to bookrunners decreases. This prevents very large differences in amounts attributed to bookrunners and other participants.

Table 2: Commitment assigned to bookrunner groups

Bookratio	Loans	Issuances
> 1/3	75%	75%
> 2/3	60%	75%
> 1.5	40%	75%
> 3.0	< 40%*	< 75%*

* In case of deals with a bookratio of more than 3.0, we use a formula which gradually lowers the commitment assigned to the bookrunners as the bookratio increases. The formula used for this:

$$\frac{\frac{1}{\sqrt{bookratio}}}{1.443375673}$$

The number in the denominator is used to let the formula start at 40% in case of a bookratio of 3.0. As the bookratio increases the formula will go down from 40%. In case of issuances the number in the denominator is 0.769800358.

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