

# No wood for the trees

Which consumer goods companies are addressing deforestation issues?

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# Linking deforestation to earnings for consumer companies

As the deadline set by the Consumer Goods Forum's resolution to achieve zero net deforestation by 2020 approaches, it seems particularly timely to initiate on CDP's first Investor Research report on deforestation. We cover companies in the consumer goods sector and include 22 Food Manufacturers, Personal & Household Goods Manufacturers and Fast Food Retailers. The report seeks to evaluate the relative risks and opportunities these businesses face from the challenges posed by deforestation in their supply chain.

Companies featured in this report are among the largest in their sectors and have been chosen based on the scale of their businesses and commodity use. They account for 3.1% of the MSCI ACWI World companies by market capitalisation. Companies are listed in Europe, the U.S. and Japan; all with global operations and most with a large and growing presence in emerging markets.

The consumer goods sector is directly impacted by inter-governmental mandates on sustainable consumption and production. These initiatives have not only contributed to consumer trends towards more sustainable food sources and ingredients, but also threaten the traditional supply chain models that have for so long been integral to mainstream businesses. Consumer-facing companies are particularly exposed to Forest Risk Commodities (FRCs), with palm oil, soybean and cattle playing a major role in product formulation, whilst paper & pulp products are essential to the packaging and marketing of these products.

However, these commodities cannot and should not be completely eradicated from supply chains. Palm oil, for example, is the most productive vegetable oil in the world, producing 6 to 10 times more oil per hectare than other oil crops such as soy and sunflower. Substituting palm oil with other types of vegetable oil in the face of increasing consumer pressure could erroneously lead to further deforestation elsewhere in the food system. Companies should instead look at ways to eliminate deforestation from their supply chains through traceability, certification and engagement with all supply chain actors to mainstream sustainable agriculture practices.

## Key findings

- ▼ **The Consumer Goods Forum resolution to achieve zero net deforestation by 2020 will not be met**, indicating a growing gap between companies' ambitions and targets.
- ▼ **No company has complete traceability of palm oil and cattle to plantation / farm of origin.**
- ▼ **Current certification and traceability systems are not effectively addressing the issue of deforestation.** Certified volumes account for just 20% of global palm oil production.
- ▼ Multi-stakeholder engagement needed to halt deforestation; **only eight out of 22 companies deploying landscape style approaches or regenerative agriculture.**
- ▼ Palm oil has been the focus of efforts relating to deforestation. **45% of companies reported revenue dependencies of at least 20% on palm oil.**
- ▼ Disclosure lags for cattle and soy; **cattle as much as 400 times<sup>(1)</sup> and soybean oil 8.2 times<sup>(2)</sup> more land intensive than palm oil.**
- ▼ **Hidden use of FRCs** such as the indirect use of soymeal in supply chains contribute to deforestation and there is a lack of transparency in labelling of animal derivatives in certain consumer products.
- ▼ Supply chains are exposed to physical risks of climate change - **90% of global palm oil production is concentrated in Southeast Asia in low-lying land exposed to coastal flooding.** This could jeopardise global supply and risk further deforestation inland.
- ▼ **Substituting the use of FRCs with other raw materials could lead to higher land use and more deforestation:** Rapeseed uses five times more land than palm oil.
- ▼ 70% of food companies have invested in plant-based meat alternatives, **however this investment is happening in only niche brands or start-ups.**
- ▼ **European companies, Danone, Nestlé, Unilever and L'Oréal, lead with robust governance of deforestation risk.** Unilever and L'Oréal are managing significant exposures in their supply chains.

Due to their proximity to the consumer, companies included in the report face tangible financial and operational risks associated with deforestation due to changing consumer patterns and supply chain stresses. Yet, businesses able to turn these risks into opportunities through developing innovations in sustainable consumption and production have a competitive edge over their peers. We are already seeing significant developments in plant-based foods and a change in supply chain models that bring consumer goods manufacturers closer to the field.

In this report we assess how well aligned companies are to the zero net deforestation commitments set out by the Consumer Goods Forum looking at the risks and opportunities for the sector against a backdrop of growing population and the planetary constraints to supply these key soft commodities. There are four key areas assessed in the League Table which are aligned with the G20 Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD):

**Transition risks:** We assess companies' disclosure on and exposure to the FRCs timber, cattle, palm oil and soybean, in addition to business resilience and land use associated with these commodities.

**Physical risks:** We assess companies' exposure to acute and chronic physical risk events as potential drivers of further deforestation in raw material supply chains.

**Transition opportunities:** We assess companies' foresight in identifying and acting on opportunities relating to sustainable consumption and production.

**Governance & strategy:** We assess companies' deforestation-related governance and strategic frameworks through the strength of its board level expertise, risk management policies, commitments, implementation, reporting, targets and delivery. We also score a company based on their CDP Forests 2018 score.

▼ **McDonald's performs much better than other fast food retailers Yum! Brands and RBI.** McDonald's actively engages with its suppliers and has robust risk management systems in place.

▼ **RBI, Tyson Foods and Kraft Heinz rank last.** All are exposed to land-intensive cattle and perform weakly on FRC disclosure.

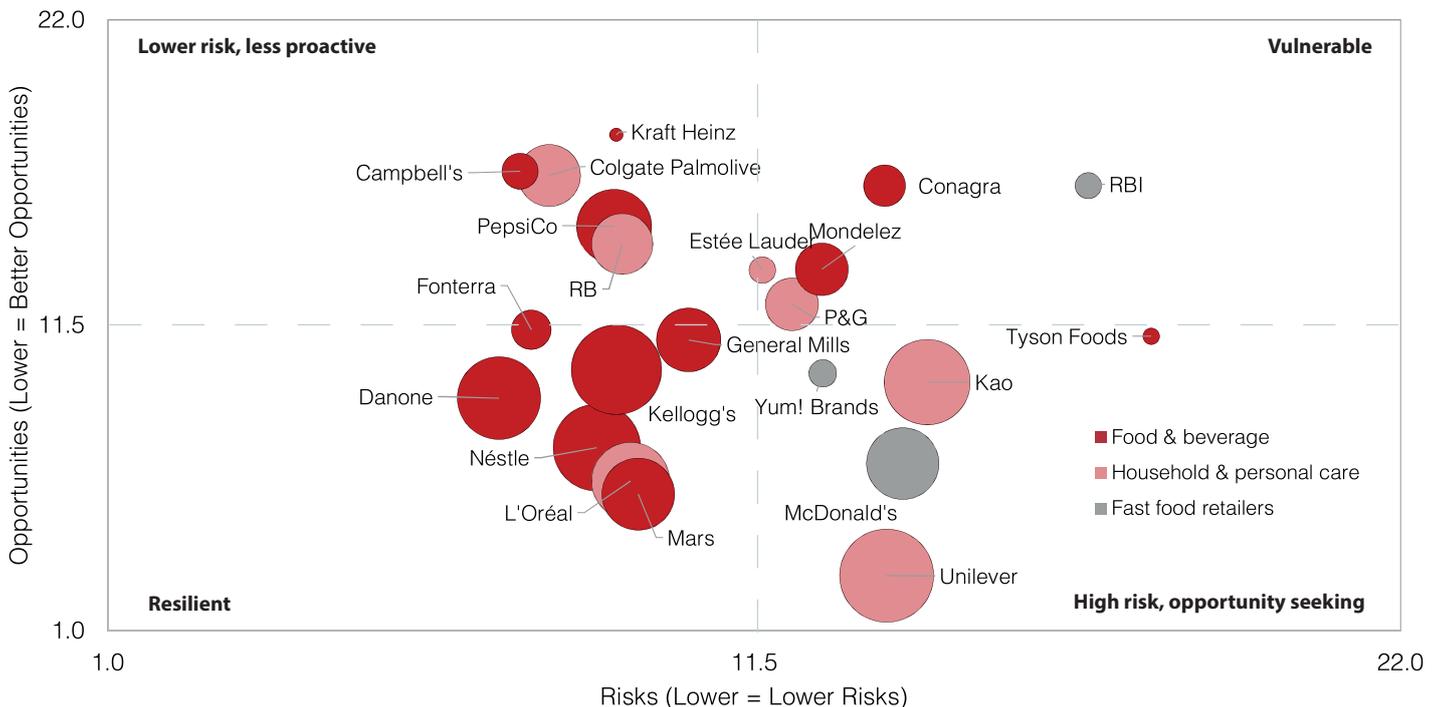
**Figure 1: League Table summary** <sup>(i)</sup>

LT rank	Company <sup>(ii)</sup>	Headquartered	Average market cap 2018 (US\$bn)	Weighted rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank	Business split (%)
1	Danone	France	56.5	7.42	3	5	6	5	
2	Nestlé	Switzerland	313.9	7.52	8	6	5	3	
3	L'Oréal	France	160.6	7.96	9	8	3	6	
4	Unilever	UK / Netherlands	160.4	8.05	20	4	1	1	
5	Kellogg's	US	22.0	8.14	10	7	9	2	
6	Mars	US	PRIVATE	8.24	13	2	2	8	
7	PepsiCo	US	185.9	10.25	5	13	18	7	
8	McDonald's	Global	146.9	10.42	16	18	4	9	
9	General Mills	US	31.8	10.45	12	12	10	10	
10	Kao	Japan	37.8	10.51	17	19	7	4	
11	Fonterra	New Zealand	4.1	10.87	1	14	12	16	
12	RB	UK	53.5	10.99	7	9	16	12	
13	Colgate-Palmolive	US	57.3	10.99	6	3	20	11	
14	P&G	US	300.9	12.27	15	10	13	13	
15	Campbell's	US	14.3	12.39	2	11	21	17	
16	Mondelez	US	75.9	12.74	19	1	14	13	
17	Yum! Brands	US	29.8	13.31	14	21	8	18	
18	The Estée Lauder Companies Inc. <sup>(iii)</sup>	US	67.7	13.87	11	20	15	19	
19	Conagra	US	13.8	14.61	18	15	19	15	
20	Kraft Heinz	US	40.7	14.85	4	17	22	22	
21	Restaurant Brands International <sup>(iv)</sup>	Canada	31.5	16.60	21	22	17	20	
22	Tyson Foods	US	32.5	16.73	22	16	11	21	

**Weighting**

(i) Weighted ranks are calculated for each area. We display non-weighted ranks in this summary for simplicity only.  
 (ii) Nestlé, P&G and Mondelez are non-responders to CDP's 2019 forests questionnaire. We encourage investors to raise this lack of transparency in discussions with company management.  
 (iii) The Estée Lauder Companies Inc. will be referred to as Estée Lauder for the remainder of the report.  
 (iv) Restaurant Brands International will be referred to as RBI for the remainder of the report.  
 Source: CDP

**Figure 2: Deforestation risks vs opportunities**



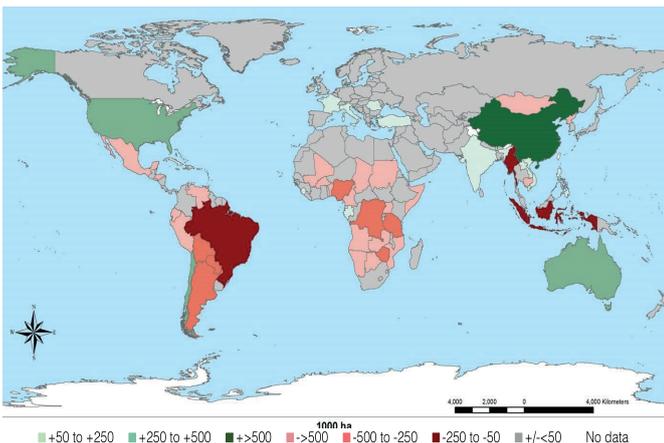
Bubble size represents performance in deforestation governance & strategy where a larger bubble size indicates better performance  
 Source: CDP

# Overview

## Deforestation and agriculture

The increasing demand for FRCs has led to an increase in forest loss and degradation, with agriculture accounting for 80% of tropical forest loss<sup>(3)</sup>. There has been no abatement of this trend and tropical forests in Southeast Asia and South America continue to be felled at an alarming rate to make way for land used in the production of beef, soy and palm. In 2017 alone, 15.8 million hectares of forests were lost to agriculture, the equivalent of 40 football fields converted every day<sup>(4)</sup>. Close to half of agriculture-led forest conversion between 2000-2012 has been estimated to be caused by illegal deforestation, highlighting a significant issue for public and private forest governance.

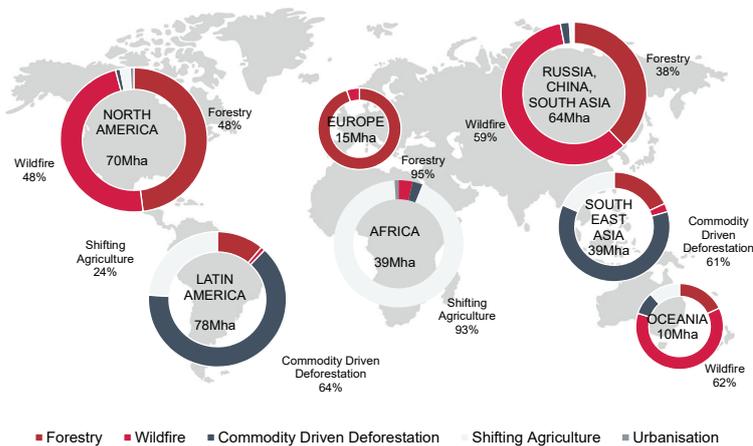
**Figure 3: Annual change in forest area 2010-16**



Source: Food and Agriculture Organization of the United Nations

Cattle-ranching, soybean production and palm oil cultivation have driven nearly 40% of commodity related deforestation since 2005, particularly in Southeast Asia and South America.

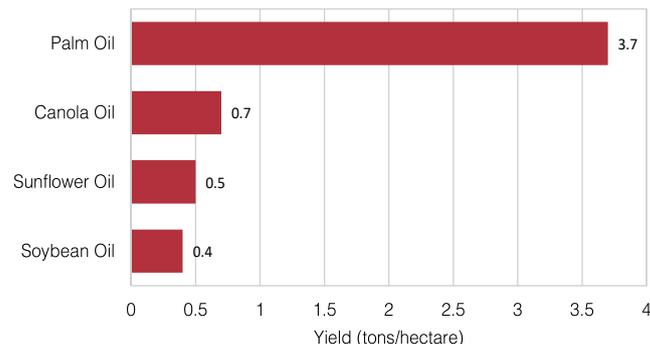
**Figure 4: Regional drivers of tree cover loss 2001-15**



Source: World Resources Institute, Curtis et al.

Southeast Asia is home to 15% of the world's tropical forests and has one of the highest rates of deforestation globally, with palm oil and forestry products driving 60% of commodity-driven deforestation in the region. Originally from West Africa, over 80% of global palm oil is produced in Malaysia and Indonesia today. Palm oil represents 35% of global vegetable oil production and is easily the most productive vegetable oil in the market, yielding more than 3.5 tonnes of oil per hectare. Palm oil and its derivatives are commonly found in food, personal care, household goods and biofuels, making them critical ingredients in many consumer goods products.

**Figure 5: Yields of vegetable oils per hectare**



Source: Palm Done Right

Cattle ranching has accounted for 40% of global commodity-led deforestation since 2005, and is particularly acute in the Amazon region, where cattle ranching has led to 80% of the area's deforestation. Easy transportation links, low input costs and the availability of cheap land makes the emphasis on livestock yield a low consideration in Brazil, driving further expansion and deforestation rather than production efficiency<sup>(5)</sup>. Most of the cattle produced in Brazil is consumed domestically, whilst China and Hong Kong together account for 44% of Brazil's global exports. Brazil is also a major exporter of beef tallow, a common ingredient in soap<sup>(6)</sup>.

The other major cause of deforestation in the Amazon is the cultivation of soy, with Brazil having overtaken the U.S. as the largest global producer of soy, representing over 35% of global output<sup>(2)</sup>. Soybeans produce more protein per hectare than any other major crop and growth in soy production has enabled huge global increases in livestock production over the last 50 years. Only 6% of the soy produced is used for oil or consumed directly by humans, as whole beans or as oil or soy derivatives in processed foods. Around 80% of the soy cultivated in the Amazon region is destined for animal feed<sup>(7)</sup>.

Timber, another major cause of global deforestation, is used to make paper and pulp products that are used to package and transport consumer goods. Illegal logging is a huge driver of deforestation, with more than 30% of the world's timber considered to be "conversion timber", cut during the illegal clearing of tropical forests for palm oil plantations.

The role of palm oil, soy, timber and cattle in driving deforestation across carbon-rich tropical forests is thus material to companies exposed to these commodities.

## Deforestation and climate change

Forests store the equivalent of a trillion tonnes of carbon and are important dynamic carbon sinks that continuously exchange carbon dioxide with the atmosphere. Forests contain a huge abundance of carbon, with close to 30% stored in the biomass and 70% in the soil.

The role of forests in climate change is multi-faceted; they are carbon pools with the potential to become huge sources of carbon dioxide when their natural order is disturbed and yet play the role of major carbon sinks when they are expanded. Forests absorb more carbon dioxide than they emit and carbon dioxide emissions from deforestation has been found to equate to 30% of all fossil fuel emissions<sup>(8)</sup>.

(3) G.Kissinger, M.Herold, V.De Sy: Drivers of deforestation and forest degradation

(4) Global Forest Watch: 2017 was the worst year on record for tropical tree cover loss

(5) Global Forest Atlas: Cattle ranching in the Amazon region

(6) Chain Reaction Research: Rising Brazilian beef exports to China test sustainability commitments

(7) Unit of Concerned Scientists: Soybeans

(8) NASA: Goods news on forests and carbon dioxide

The impact of land use and land cover change since 1850 has been found to account for 40% of all warming over the same period. Climate change is already causing extreme weather events such as floods and droughts, leading to the destruction of carbon-absorbing land. Limiting the contribution of deforestation to climate change is a key imperative.

## Deforestation and consumer goods

Deforestation has the potential to impact consumer goods companies from all points on the value chain and impacts of these risks and opportunities diverge depending on their business models. Food manufacturers that might be dependent on animal ingredients could look to diversify their portfolios away from these ingredients and reduce their cattle and soymeal footprint in the process. Personal and household goods companies with cost and volume reliance on palm oil would benefit from closer engagement with upstream suppliers of FRCs, defending themselves against volatility and commodity supply shocks.

### Changing consumer preferences

Due to their position in the value chain, consumer goods companies face unique risks and opportunities resulting from their proximity to the consumer. From a risk perspective, they are highly exposed to changes in consumer preferences and reputational risks compared to upstream industrials. From an opportunity perspective, this proximity gives them the ability to engage directly with their consumers and drive behavioural change to shape the markets into which they sell, ensuring the longevity of their brands.

Companies able to exploit their wealth of consumer insights to drive and deliver sustainable consumption solutions will be in pole position to deliver growth amid changing consumer preferences.

### New world order in supply chains

The narrative needs to not only be focused on the sustainable consumption but also the sustainable production of food. The fight against deforestation towards more sustainable food systems needs to see consumer goods companies working more closely with actors along the entirety of their supply chains, driving improvement in transparency and engagement upstream.

Many companies have taken their first steps in the fight against deforestation, through improved certification of their FRC supply. However, certification as the sole tool against deforestation risks creates a bifurcated market; one with 'good' supply and a second with 'bad' supply.

There has already been acknowledgement that much more has to be done upstream. Full and deep transparency of supply chains allow companies to hold producers to account and provide consumers with full visibility into the source of their food and products. Technologies such as CDP, Starling, Global Forest Watch and Trase facilitating this shift to total transparency.

But a consumer goods company's responsibility does not stop at transparency and certification. There needs to be engagement upstream. Smallholders manage 80% of the farmland in sub-Saharan Africa and Asia and we are seeing evidence that companies are actively looking at transformative innovations to shorten the supply chain, directly collaborating on smallholder initiatives.

Companies looking at innovative ways to transform their supply chains are better placed in to face the challenges posed by sustainable production.

## UN Sustainable Development Goals

The UN Sustainable Development Goals established in 2015 by the United Nations General Assembly set out the blueprint for achieving a better and sustainable future for all. These goals are universal, applying to all nations and people, with the aim of addressing the global challenges relating to poverty, inequality, environmental degradation, prosperity and peace and justice by 2030.

Pertinent to the consumer goods segment is "SDG 12: Ensure sustainable consumption and production patterns". This sets out the goal of ensuring that current material needs do not lead to the over-extraction of resources or to the degradation of environmental resources, and should include policies that improve resource efficiency, reduce waste and mainstream sustainability practices across all sectors of the economy. Consumer goods companies play an important role in achieving this goal due to their proximity to the end-consumer and their collective ability to effect change upstream.

The population in developing regions is expected to grow from 7.7 billion people worldwide in 2019, to around 8.5 billion in 2030, 9.7 billion in 2050, and 10.9 billion in 2100<sup>(9)</sup>. This growth in population is expected to be accompanied by a growth in consumption; between 2010 and 2020, the world's poorest 40% will nearly double their spending power.

The expected demand on the world's food systems to provide adequate nourishment is unprecedented, and environmental and social conditions are already affecting our ability to produce enough food to meet this growing demand. Consumer goods companies need to be able to find a balance between satisfying the needs of society with the needs for the planet.

Only companies with the acute awareness of the intricate balance between all these goals can position themselves for a future of sustainable growth.

## Consumer Goods Forum

In 2010, the Consumer Goods Forum (CGF) set out a resolution to achieve zero net deforestation by 2020. This commitment focuses on soy, palm oil, paper and pulp and cattle and their impact on deforestation and its contribution to carbon emissions. It had the support of the CGF's 400 member companies with the aim to involve the private sector in transforming commodity supply chains.

Close to a decade has passed since the CGF's original net zero deforestation commitment and today we see a growing gap between ambition and action on the issue. In September 2019, both Nestlé and P&G acknowledged that they will fall short of the zero net deforestation goal for 2020 and only three companies within our universe have achieved 100% certification in palm oil, just 1 in timber. Whilst companies' ambitious targets indicate they understand the need for action on deforestation, many are falling short of reaching their stated goals to significantly reduce deforestation in their supply chains.

Going forward, ambition on tackling deforestation needs to be matched with a shift towards more sustainable production and consumption of these four FRCs.

# Key report findings

- ▼ **European companies, Danone, Nestlé, Unilever and L'Oréal have focused on transition opportunities** and have more robust governance of deforestation-related risks.
- ▼ **McDonald's performs significantly better than Yum! Brands and RBI.** McDonald's actively engages with its suppliers and has robust risk management systems.
- ▼ **Privately run company, Mars, performs well,** engages with smallholders on landscaping and regenerative agricultural techniques. It is the only company that has a goal to hold flat the amount of land area associated with its value chain.
- ▼ **RBI, Tyson Foods and Kraft Heinz come bottom.** RBI and Tyson Foods are exposed to land-intensive cattle and perform weakly on FRC disclosure.

## Transition risks

- ▼ **Ten companies reported more than a 20% revenue dependency on palm-related ingredients,** including all Personal Care & Household companies.
- ▼ **Personal Care and Household Goods companies are largely exposed to palm kernel oil and palm oil derivatives,** for which there is limited supply of certified product.
- ▼ **Kao, L'Oréal, Estée Lauder and Mondelez depend on palm-based ingredients for at least 60% of their revenues.** Palm oil also represents more than 10% of procurement costs at Kao and L'Oréal.
- ▼ **Unilever's reported consumption of palm-based ingredients represents 5.8% of global volumes of certified palm oil,** 15% of global volumes of certified palm kernel oil.
- ▼ Traceability is highest for palm oil and **close to 70% of companies report the traceability of more than 90% of their palm oil supply** to the mill of origin.
- ▼ While palm oil has been the focus of efforts relating to deforestation **not all stakeholders are reporting on the hidden use of FRCs within their supply chains.** Companies have indirect exposure to soymeal through animal ingredients and there is no clear labelling for animal derivatives in consumer goods products.
- ▼ **Conagra and Tyson Foods both report significant revenue dependencies on both soy and cattle.** Tyson Foods has a huge dependence on soymeal used as poultry feed.
- ▼ Personal Care and Household Goods companies, **RB and Colgate-Palmolive also report on the use of cattle-based tallow** in their soaps.
- ▼ Companies exposed to cattle-products are more exposed to risks associated with land-use. **Cattle ranching is as much as 400 times more land-use intensive than palm oil.**
- ▼ P&G and Kao have higher exposures to timber due to their baby hygiene, sanitary care and tissue businesses.

## Physical risks

- ▼ **Close to 90% of global palm oil production is concentrated in Southeast Asia along low lying areas exposed to sea levels or coastal flooding** which could jeopardise global supply and risk further deforestation inland.
- ▼ **Mondelez and Unilever lead the group for palm oil sourcing,** sourcing from areas with the lowest exposure to forest fire, drought and coastal flooding.
- ▼ **Production is spread out across geographies for soy and cattle** therefore the impact of climate change is more variable.

## Transition opportunities

- ▼ **Most companies are focused on supply side opportunities rather than demand side opportunities.** On average companies have deployed nearly 3x the amount of sustainable production initiatives as sustainable consumption initiatives.
- ▼ While over **70% of food companies have invested in plant-based meat alternatives** this investment is happening through niche brands or start-ups only.
- ▼ Substituting the use of FRCs with other alternative could in some cases lead to higher land use and more deforestation: **5x more land is needed to yield the same amount of rapeseed oil compared to palm oil.**
- ▼ Multi-stakeholder engagement needed to halt deforestation; **only 8 out of 22 companies deploying landscape style approaches or regenerative agriculture.**
- ▼ **95% of companies in the group have developed initiatives on basic supplier capacity building.** Over 60% have paired these basic engagement programs with the deployment of smart agri-tech and/or new seed varieties

## Governance & strategy

- ▼ **A growing gap between companies' ambition and targets** is indicated by failure to meet the CGF's resolution to achieve zero net deforestation by 2020.
- ▼ **European companies perform well on board-level management** and many have board members with previous experience in sustainability issues.
- ▼ **Only 20% of companies have commodity specific policies for all FRC exposures.**
- ▼ **30% of reported palm oil targets are more than 30% short of delivery.**
- ▼ However, companies do realise the need for multi-stakeholder engagement and **70% of companies have commitments regarding the facilitation of smallholders into their supply chains.**

## Company selection and classification

Companies were selected from the largest publicly listed Consumer Goods companies, based on current market capitalization and those that were perceived to be major consumers of FRCs. The companies cover the following three sub-sectors. While these sub-sectors are associated with different underlying business models the dynamics of supply chain issues are comparable across the universe and therefore these companies were assessed together.

- ▼ Fast Food Retailers (3 companies)
- ▼ Food and Drink Manufacturers (12 companies)
- ▼ Household and Personal Care Manufacturers (7 companies)

**Figure 6: Summary of key areas, associated metrics and weights within the League Table**

Key area in League Table	Financial impact	Metrics	Metric weighting	Key area weighting
Transition risks	As consumer preferences change, demand for products with high environmental impacts would be impacted.	<ul style="list-style-type: none"> <li>• <b>Sustainable consumption risks</b> <i>Revenue exposure to FRCs (90%), Commodity intensity (10%)</i></li> </ul>	35%	35%
	We acknowledge that SDG 15: Sustainable consumption and production cannot be achieved through the eradication of FRCs from supply chains. We believe that a more holistic approach needs to be taken and call for the sustainable sourcing for raw materials.	<ul style="list-style-type: none"> <li>• <b>Sustainable production risks</b> <i>Supply risk (35%), Market volatility risk (35%), Supply chain transparency (15%), Regulatory risk (15%)</i></li> <li>• <b>Capital resilience</b> <i>Free cash flow conversion (40%), Net debt/EBITDA (40%), EBITDA margin (20%)</i></li> </ul>	35%	
	Business resilience could be improved by maintaining free cash flow generation and defensiveness of sector through development of robust risk mitigation strategies as resource constraints grow.	<ul style="list-style-type: none"> <li>• <b>Land use</b> <i>Land use (50%), Land use intensity (50%)</i></li> </ul>	20%	
Physical risks	Increases in the frequency and severity of physical extremities could have the potential to cause significant disruption across the raw material supply chain. The huge reliance of consumer goods products on FRCs could see physical disruptions such as rising sea levels cause further deforestation.	<ul style="list-style-type: none"> <li>• <b>Palm oil</b> <i>Drought risk (40%), Flood risk (40%), Forest fire risk (20%)</i></li> </ul>	60%	10%
		<ul style="list-style-type: none"> <li>• <b>Soy</b> <i>Drought risk (40%), Flood risk (40%), Forest fire risk (20%)</i></li> </ul>	15%	
		<ul style="list-style-type: none"> <li>• <b>Cattle</b> <i>Drought risk (40%), Flood risk (40%), Forest fire risk (20%)</i></li> </ul>	15%	
		<ul style="list-style-type: none"> <li>• <b>Timber</b> <i>Flood risk (100%)</i></li> </ul>	10%	
Transition opportunities	Significant opportunities exist to grow revenues from sustainable consumption opportunities and seek improvements in sustainable production through engagement with stakeholders throughout the supply chain.	<ul style="list-style-type: none"> <li>• <b>Sustainable production opportunities</b> <i>Group level sustainable production activities (100%)</i></li> </ul>	45%	25%
		<ul style="list-style-type: none"> <li>• <b>Sustainable consumption opportunities</b> <i>Group level sustainable consumption activities (100%)</i></li> </ul>	30%	
		<ul style="list-style-type: none"> <li>• <b>Brand analysis</b> <i>Analysis of top 10 brands (100%)</i></li> </ul>	10%	
		<ul style="list-style-type: none"> <li>• <b>Research &amp; Development</b> <i>R&amp;D as a percentage of sales (100%)</i></li> </ul>	10%	
		<ul style="list-style-type: none"> <li>• <b>Progress</b> <i>Reduction in FRC volume 2017-18 (100%)</i></li> </ul>	5%	
Climate governance & strategy	Ambition level of target setting and strength of climate governance provides insight into companies' strategies in adapting to a low-carbon economy and capitalising on climate-related opportunities.	<ul style="list-style-type: none"> <li>• <b>Deforestation strategy</b> <i>Policy implementation (60%), Targets and delivery (20%), Social score (20%)</i></li> </ul>	40%	30%
		<ul style="list-style-type: none"> <li>• <b>Board &amp; executive level management</b> <i>Sustainable procurement-compentnet director score (40%), Board committee score (30%), Executive committee score (30%)</i></li> </ul>	25%	
		<ul style="list-style-type: none"> <li>• <b>Risk management scorecard</b> <i>Assessment of deforestation risk management processes (100%)</i></li> </ul>	15%	
		<ul style="list-style-type: none"> <li>• <b>Commitment scorecard</b> <i>Assessment of deforestation commitments (100%)</i></li> </ul>	10%	
		<ul style="list-style-type: none"> <li>• <b>CDP score</b></li> </ul>	10%	

## Linking our findings to investment choices

We recognize that investment decisions are based on a multitude of different factors and that some of these can be misaligned with zero-net deforestation efforts. Our League Table identifies the transition risks associated with a company's exposure to FRCs, their provisions for transitioning to zero-net deforestation supply chains and the physical impacts of climate change on deforestation in their supply chains. We would flag the extremes of the league table, and that companies towards the bottom of our League Table are potentially higher risk investments from a deforestation perspective than those towards the top.

## Methodology

We score each company based on metrics which are ranked and then weighted within each key area. We then assign traffic light colours based on these weighted ranks. We calculate the overall League Table score by collating the weighted ranks for each key area. Each of the key areas has a separate chapter within this report.

Data is compiled from multiple sources including; CDP Forest / Climate questionnaire responses, company annual reports, SEC filings, sustainability reports, company sustainability websites, investor presentations, RSPO, and third-party sources such as Bloomberg and Euromonitor. Where data is not available for a company, the company will not appear in the chart or table for that metric.

**Figure 7: Disclosure by commodity**

Company	Palm disclosure	Soy disclosure	Timber disclosure	Cattle disclosure
Nestlé	Non-respondent			
PepsiCo	✓	✗	✓	✗
Tyson Foods	✗	✓	✗	✓
Mars	✓	✓	✓	✓
Danone	✓	✓	✓	✗
Kraft Heinz	✓	✗	✗	✗
Mondelez	Non-respondent			
General Mills	✓	✗	✓	✗
Fonterra	✓	✓	✓	✗
Kellogg's	✓	✓	✓	Not used
Conagra	✓	✓	✓	✓
Campbell's	✓	✓	✓	✓
P&G	Non-respondent			
Unilever	✓	✓	✓	✗
L'Oréal	✓	✓	✓	Not used
RB	✓	✓	✓	✓
Colgate-Palmolive	✓	✓	✓	✓
Estée Lauder	✓	✗	✓	✗
Kao	✓	Not used	✓	Not used
McDonald's	✓	✓	✓	✓
Yum! Brands	✓	✗	✓	✗
RBI	✓	✓	✓	✓

Source: CDP

## Transition risks

- ▼ 10 companies reported more than a 20% revenue dependency on palm-related ingredients and include all Personal Care and Household Goods companies.
- ▼ Palm oil has been the focus of efforts relating to deforestation. But not all stakeholders are reporting on the hidden use of FRCs within their supply chains; some have indirect exposure to soymeal through animal ingredients and there is no clear labelling for animal derivatives in consumer goods..
- ▼ Increased scrutiny by banks could identify cashflow risks from supply chains.

### Overview

In this section, we aim to identify companies that are more exposed to deforestation-related risks through the value chain from field to consumer. Companies are evaluated for the revenue risks, upstream risks encountered in transitioning to sustainable supply chains, business resilience and land use. All companies included have significant exposure to FRCs and are reliant on agricultural supply chains to deliver earnings. The companies included in this report have been selected based on their proximity to the end consumer and their potential exposure to risks in their supply chain due to deforestation and land-use change.

### Sustainable consumption

Responses from CDP Forest 2019 indicate that within the consumer goods sector, some companies have as much as a 90% exposure to FRCs. With their large reliance on FRCs to deliver sales, companies are particularly susceptible to changing consumption preferences towards more sustainable products.

Brand equity can be vulnerable to negative publicity, consumer environmental concerns, or advocacy campaigns; Greenpeace has launched international campaigns drawing attention to companies and products and the impact of their sourcing policies on deforestation. Social media can see other similar campaigns go viral, impacting demand for sustainable products.

Consumer boycotts or the risk of consumer boycotts can change the relationship that manufacturers have with retailers and lead to the wholesale loss of contracts by retailers concerned about human rights or environmental impacts in their supply chain. Major supermarket retailers hold significant power in most regions; Tesco, Carrefour, Lidl and Aldi command close to 20% of the grocery market share in Europe, Walmart and Kroger control a similar fraction of the market in the U.S.

### Sustainable production

Sourcing of FRCs is an increasingly challenging issue for consumer goods companies and disruption in the supply chain can could impact profitability. To avoid risks to profitability, companies need to develop

new supply chain strategies and move away from business as usual agriculture.

Companies that require large volumes of raw material may face capacity constraints from suppliers. This is especially true in the case of certified commodities in palm and soy where there is a constraint on the supply of certified material. Without the required raw materials or viable substitutes, conversion of raw material to final product could be impeded and impact revenues.

Volatility in raw material prices can impact manufacturers profit margins, and many manufacturers lack the flexibility to quickly respond to market volatility.

Margins could also be impacted in the event of a shortage of certified volumes if huge premiums are placed on certified raw material. Whilst the price premium on certified palm / soy is not significant, it is worth noting that the Fairtrade premium on soybean is 10%<sup>(10)</sup>. With FRCs contributing to as much as 30-40% of procurement costs within the group, margins can be impacted by market price volatility.

Traceability of supply chains has given manufacturers the ability to identify and trace the history, distribution, location and application of its raw materials, driving improvements in the quality of sustainability of raw materials. This visibility can have other benefits helping companies in reducing food waste, analyse yield and maximise operating efficiencies. Having full transparency within the supply chain also allows companies to identify risks early and reduce the risk of raw material procurement.

Tackling deforestation is moving up the regulatory agenda particularly in relation to its significant role in tackling climate change. Earlier in the year, the European Commission ruled the cultivation of palm oil from Malaysia and Indonesia to be the cause of excessive deforestation hence not be eligible for inclusion toward EU renewable transport targets for national governments. Regulations could be enforced for FRCs, in a similar vein to the EU Timber Regulation and the Conflict Mineral Regulation, which could include mandatory certification requirements, and companies with a higher proportion of certified material in their portfolios today face less disruption.

(10) Fair Trade

## Capital resilience

Companies with more resilient business models are better placed to adapt to economic uncertainty, increased regulatory scrutiny and market uncertainty. These companies have the greater ability to drive market innovation and transformation in the face of changing customer trends and production models.

Debt of the more highly leveraged companies in the universe could also come under scrutiny based on risks of FRCs. In 2014, major banks signed up to the Soft Commodities Compact initiative, with a focus on the food and timber commodities that have the highest impact on deforestation. The Compact aims to align bank practice with the Consumer Goods Forum's resolution on deforestation through the development of banking practices that finance the transformation of supply chains. Although the focus of the Soft Commodities Compact has been on the upstream producers, the move to align bank practices with the CGF's zero net deforestation commitment could potentially lead to a decline in credit ratings of companies that fail to implement risk mitigation processes and lead to an increase in the cost of capital or the loss of debt financiers.

## Land use

With the scale of deforestation linked to FRCs, it is important to consider the linkages between a company and its land use to determine the direct impact it could have on deforestation.

Land use data can be used as an indicator used to monitor the sustainability of products produced by a company.

## Transition risk metrics

Transition risks have been assessed using the following four metrics:

### **Metric 1) Sustainable Consumption (35%):**

This metric evaluates the importance of FRCs to a company's revenue stream. We look at both revenue dependency and commodity intensity for each of the FRCs to determine the level of revenue risk for a company.

**Metric 2) Sustainable Production (35%):** This metric evaluates exposure to production risks and evaluate a company's positioning in its ability to meet supply chain, supply, market price volatility and regulatory risks that may arise to meet the rising demand for sustainable production.

**Metric 3) Capital Resilience (20%):** This metric aims to identify the companies that have the more resilient business model. Companies are evaluated based on the strength of their financial resilience using publicly available financial data.

**Metric 4) Land Use Scorecard (10%):** This metric aims to evaluate the amount of land required to produce the FRCs consumed by the companies. We looked at both absolute land use data and land intensity data.

## Overall highlights

- Strong disclosure for palm-oil supply across the group with most companies providing disclosure through CDP Forests 2019 or the Roundtable of Sustainable Palm Oil (RSPO). Tyson Foods in the exception and became a member of the RSPO in 2018.
- Weak soy and cattle disclosure across the group; 30% of companies with exposure to these FRCs have not provided any disclosure on revenue and cost dependencies.
- Fonterra and Campbell Soup come top due to their low revenue dependencies on FRCs. These companies have low FRC exposure and have provided good disclosure.

## Sustainable consumption and production

- 10 companies reported more than a 20% revenue dependency on palm-related ingredients, including all Personal Care and Household Goods companies.
- Personal Care and Household Goods companies are largely exposed to palm kernel oil and palm oil derivatives, for which there is limited supply of certified product.
- Kao, L'Oréal, Estée Lauder and Mondelez depend on palm-based ingredients for at least 60% of their revenues. Palm oil also represents more than 10% of procurement costs at Kao and L'Oréal.

- Unilever's reported consumption of palm-based ingredients represents 5.8% of global volumes of certified palm oil, 15% of global volumes of certified palm kernel oil.
- Traceability is highest for palm oil; close to 70% of companies report the traceability of more than 90% of its palm oil supply to the mill of origin.
- However, Nestlé lags, tracing just 60% and physically certifies only 31% of its palm oil supply
- Palm oil has been the focus of efforts relating to deforestation. But not all stakeholders are reporting on the hidden use of FRCs within their supply chains. Companies have indirect exposure to soymeal through animal ingredients and there is no clear labelling for animal derivatives in consumer goods.
- Conagra, Kellogg's and Tyson Foods report more than a 20% dependency on soy, as an ingredient in their food products and for poultry feed.
- Tyson Foods, Conagra and RBI report more than a 20% dependency on cattle.
- P&G and Kao have a higher exposure to timber due to their baby hygiene, sanitary care and tissue businesses. P&G consumes 1.5 million tons of air-dried pulp for use in their tissue/towel, diaper and absorbent hygiene products and 700,000 tons in paper packaging.

## Capital resilience

- ▼ L'Oréal is ahead in business resilience, performing well on Free Cash Flow conversion, EBITDA margin and financial leverage. The Personal and Household Goods companies are more resilient based on these metrics.
- ▼ Fonterra lags the group, with its low level of free cash flow conversion, high level of debt and at close to 8x net debt / EBITDA.
- ▼ Financial leverage at Restaurant Group and the company trades on a net debt / EBITDA of 5.4x.

Some of its largest debtholders are Allianz and JP Morgan who have been rank highly in the Forest 500 financial institutions list. These debtholders have strong policies addressing potential deforestation in supply chains.

## Land use

- ▼ Land use is highly dependent on the use of cattle-related products as cattle requires more than 400x more land and soy 7 times more land than palm oil.
- ▼ Tyson Foods and Colgate-Palmolive scores poorly due to their exposure to cattle and tallow.

**Figure 8: Transition risks summary**

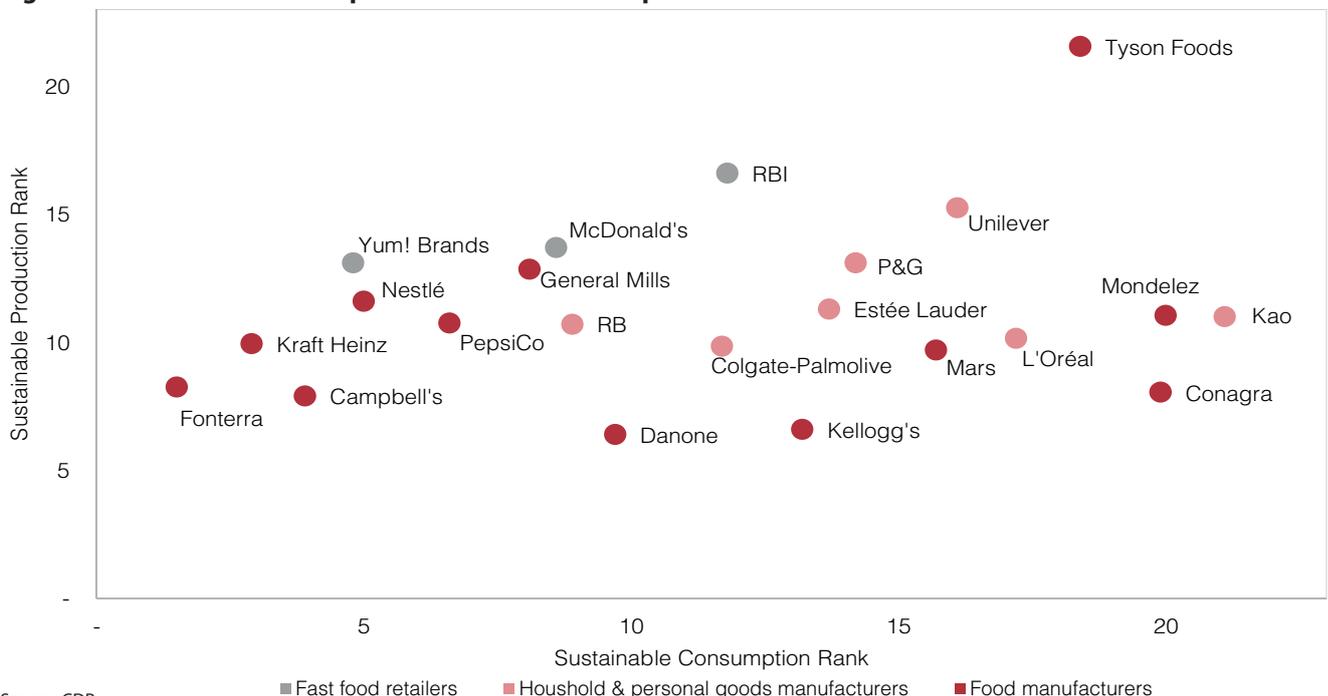
Company	Sustainable consumption	Sustainable production	Capital resilience	Land Use	Overall weighted rank	Transition risk rank
Fonterra	1	5	22	5	6.9	1
Campbell's	3	3	18	14	7.0	2
Danone	10	1	14	12	7.8	3
Kraft Heinz	2	8	21	2	7.8	4
PepsiCo	6	11	10	8	8.7	5
Colgate-Palmolive	11	7	3	21	8.9	6
RB	9	10	8	15	9.7	7
Nestlé	5	15	6	16	9.7	8
L'Oréal	18	9	1	3	9.9	9
Kellogg's	13	2	19	10	9.9	10
Estée Lauder	14	14	2	1	10.2	11
General Mills	7	16	11	4	10.5	12
Mars	16	6	7	18	10.8	13
Yum! Brands	4	17	16	9	11.3	14
P&G	15	17	5	7	12.8	15
McDonald's	8	19	12	19	13.6	16
Kao	22	12	4	11	13.7	17
Conagra	20	4	20	17	14.0	18
Mondelez	21	13	13	6	14.9	19
Unilever	17	20	9	13	15.9	20
RBI	12	21	17	20	16.8	21
Tyson Foods	19	22	15	22	19.4	22

**Weighting**                      **35%**                      **35%**                      **20%**                      **10%**

Note: In calculating the weighted rank in this table, we use the weighted ranks for each area. We display non-weighted ranks in this summary for simplicity only

Source: CDP

**Figure 9: Sustainable consumption rank v sustainable production rank**



Source: CDP

## Sustainable consumption

Sustainable consumption preferences can have a big impact on the environment as consumers become more focused on environmental impact of the consumer goods they purchase. To assess the demand side, we aim to identify companies that have significant revenue exposure to FRCs.

**Revenue Exposure Score (90%):** This metric evaluates the total Revenue exposure for palm oil, soy and cattle and was evaluated using a combination of revenue exposure (90%) and brand analysis (10%). Due to the predominance of forestry products as a medium for primary, secondary and tertiary packaging, revenue dependency for timber was evaluated using brand analysis (100%).

**Commodity Intensity Score (10%):** This metric evaluates the quantity of Forest Risk Commodity per US\$1 million turnover. The higher the commodity intensity, the greater the quantity of commodity required by the company for every unit revenue.

### Revenue exposure

The importance of FRCs on a group's revenue stream was assessed using both reported revenue dependency data and bottom-up brand exposure analysis. Brand exposure analysis was used to determine a company's timber-related exposure outside of packaging.

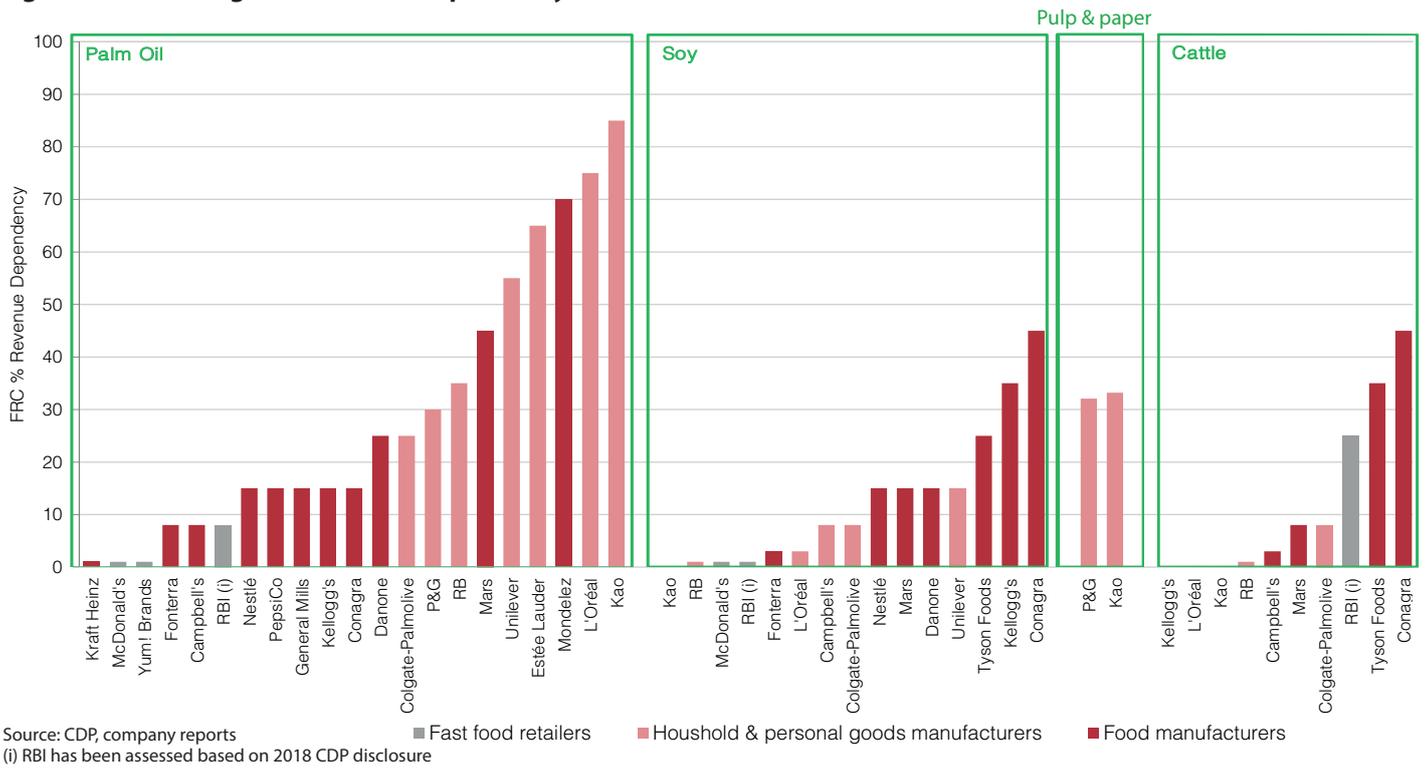
**Figure 10: Revenue exposure - best and worst performers**

	Palm Oil	Soy	Timber	Cattle	Overall
<b>Least exposure</b>	Kraft Heinz, Yum! Brands, McDonald's	Kao, McDonald's		Kellogg's, Kao, L'Oréal	1. Fonterra 2. Kraft Heinz 3. Yum! Brands
<b>Most exposure</b>	Mondelez, L'Oréal, Kao, Estée Lauder	Conagra, Kellogg's, Tyson Foods	P&G, Kao	Tyson Foods, Conagra	20. Mondelez 21. Conagra 22. Kao

Source: CDP, company reports

- ▼ Kao came bottom of the list reporting an 80-90% exposure to palm oil. The company's exposure to paper and pulp due to its baby hygiene and sanitary care businesses was estimated to be around 30%.
- ▼ 10 companies reported more than a 20% revenue dependency on palm-related ingredients and include all Personal Care and Household Goods companies. Glycerin, fatty acids and fatty alcohols derived from palm are used in the formulation of shampoos, conditioners, shower gels or skin care products.
- ▼ Food Manufacturers Mondelez and Mars reported more than a 40% revenue exposure to palm oil, which is used as a shortening agent in biscuits.
- ▼ Tyson Foods and Conagra are dependent on both cattle and soy for their revenues. Tyson Foods reported a 20-30% dependency on soy and a 30-40% dependency on cattle. Conagra reported a 40-50% dependency on soy and an equal dependency on cattle. Tyson Foods' exposure relates to its procurement of soymeal for chicken feed.
- ▼ Colgate-Palmolive and RB were the only companies in the Personal and Household Goods sector to report the use of tallow in its soaps, although less than 10% of their revenues depend on the material.
- ▼ P&G and Kao have larger exposures to timber relative to the universe due to their exposure to sales from baby products (Pampers and Merries) and feminine care (Always and Laurier). P&G is also exposed to the paper towel market, where toilet paper brand Charmin has a 25% share of the global market, Bounty with a 40% global share of the paper towel market.

**Figure 11: Percentage FRC revenue dependency**



**Commodity intensity**

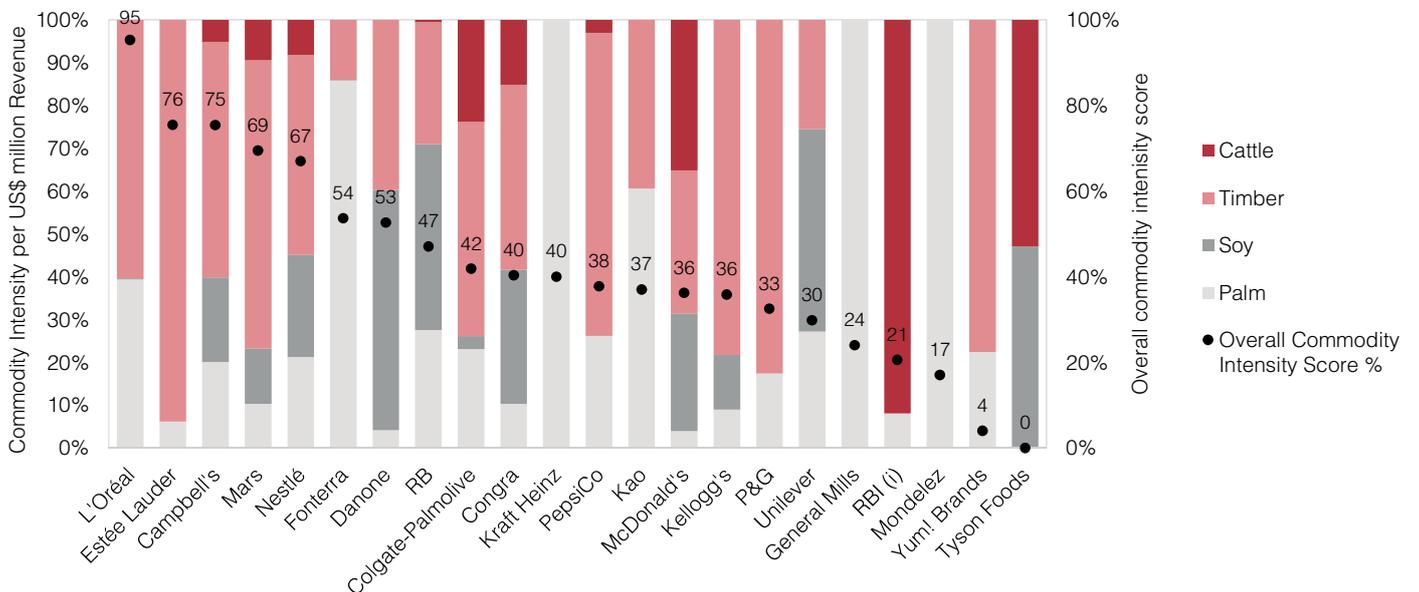
▼ L’Oréal performs well due to its low commodity intensity across palm, soy and timber. L’Oréal is calculated to use only 2.3 tonnes of palm-related material to generate US\$1 million of revenue despite a reported 60-70% revenue dependency on the FRC; the cosmetics industry uses small amounts of palm and palm kernel oil-based derivatives but across a wide range of products.

**Figure 12: Commodity intensity - best and worst performers**

	Palm Oil	Soy	Timber	Cattle	Overall
<b>Lowest intensity</b>	Kraft Heinz, L’Oréal, Estée Lauder	Kao, L’Oréal, Fonterra	L’Oréal Estée Lauder, Fonterra	Kellogg’s, L’Oréal, Kao	1. L’Oréal 2. Estée Lauder 3. Campbell’s
<b>Highest intensity</b>	Fonterra, Kao, Yum! Brands	Tyson Foods, Danone, Unilever, McDonald’s	Yum! Brands, Kellogg’s, McDonald’s	Tyson Foods, RBI, McDonald’s	20. Mondelez 21. Yum! Brands 22. Tyson Foods

Source: CDP

**Figure 13: Commodity intensity**



# Sustainable production

Our analysis of Sustainable Production is based on sub-metrics used to evaluate a company's positioning with regards to the supply of FRCs.

**Supply Score (35%):** This metric evaluates the absolute level of commodity that a company consumes within its operations. Companies needing to procure larger quantities of commodities could find challenges in sourcing required quantities.

**Market Volatility Score (35%):** This metric evaluates the impact that changes in commodity prices would have on a company's profitability. Increase in prices as a result of market tightness or increased compliance costs could have an impact on procurement costs and margin.

**Supply Chain Score (15%):** This metric evaluates the transparency that companies have on their supply chains. For each commodity, we looked at the quantity of supply traced, as well as the level of traceability achieved. Companies able to trace the source of their commodity supply down to the plantation / farm / forest level scored better than those only able to trace their source of commodity to a country level. We placed a bigger emphasis on a company's ability to trace its Palm and Timber supply.

**Regulatory Risk Score (15%):** This metric evaluates the readiness of companies in the face of increased regulation. Companies with a greater proportion of sustainably sourced commodities are better placed.

## Supply score

We rank the companies according to the volume of FRC in a company's operations. Companies that require large volumes of raw material may face capacity risks with the danger that suppliers of raw material may not have enough capacity to meet required demand, limiting revenue delivery.

**Figure 14: Supply score - best and worst performers**

	Palm Oil	Soy	Timber	Cattle	Overall
<b>Lowest volume used</b>	Estée Lauder, Kraft Heinz	Kao, L'Oréal	Estée Lauder, Campbell Soup	Kellogg Company, Kao, L'Oréal	1. Campbell's 2. L'Oréal 3. Conagra
<b>Highest volume used</b>	Unilever, Fonterra, PepsiCo	Tyson Foods, Unilever, Danone	P&G, PepsiCo	Tyson Foods, Colgate-Palmolive, McDonald's	20. P&G 21. Unilever 22. Tyson Foods

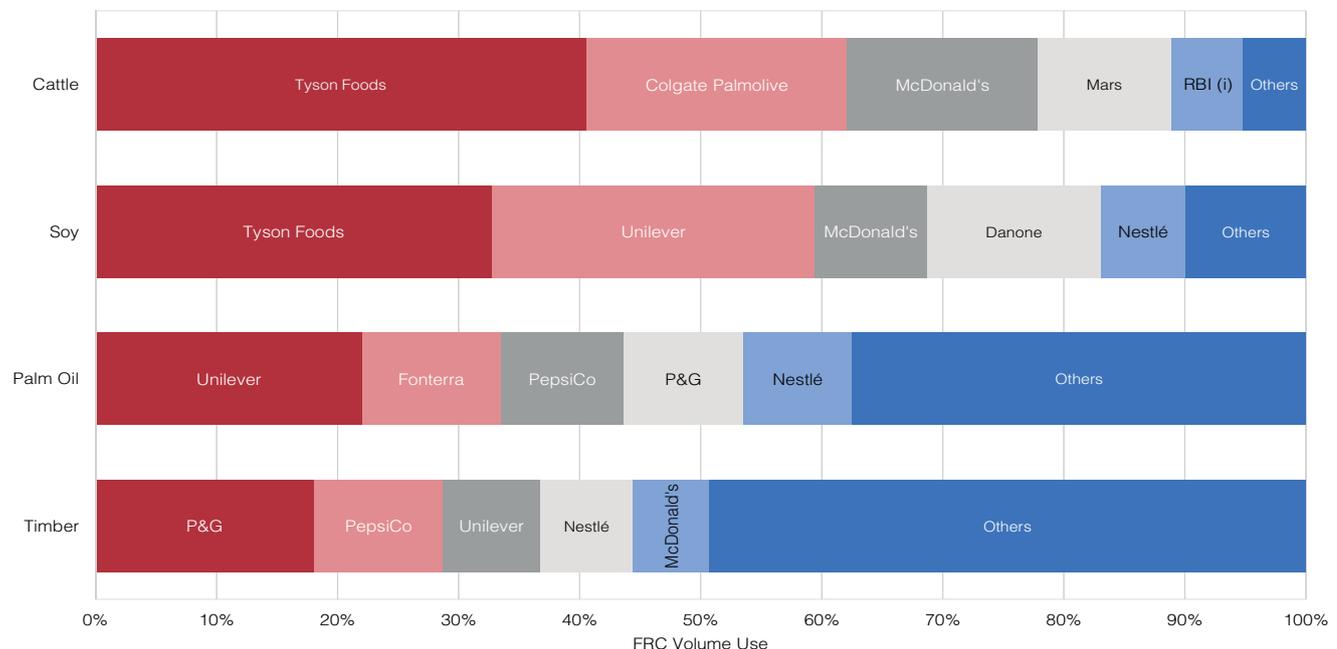
Source: CDP, company reports

Unilever's reported consumption of palm-based ingredients was 1.03 million tonnes, of which 785,000 tonnes is palm oil, 450,000 tonnes of palm kernel oil and palm oil derivatives. This represents 5.8% of global volumes of certified palm oil, 15% of global volumes of certified palm kernel oil.

Tyson Foods purchases 2.2 million metric tons of soymeal for poultry feed and 6.6 million heads of cattle a year (representing 7.5% of US cattle supply).

P&G consumes 1.5 million metric tons of air-dried pulp for use in their tissue/towel, diaper and absorbent hygiene products and 700,000 metric tons in paper packaging. This equates to close to 3% of global supply of certified paper and pulp.

**Figure 15: Top five commodity volume consumption**



## Supply chain score

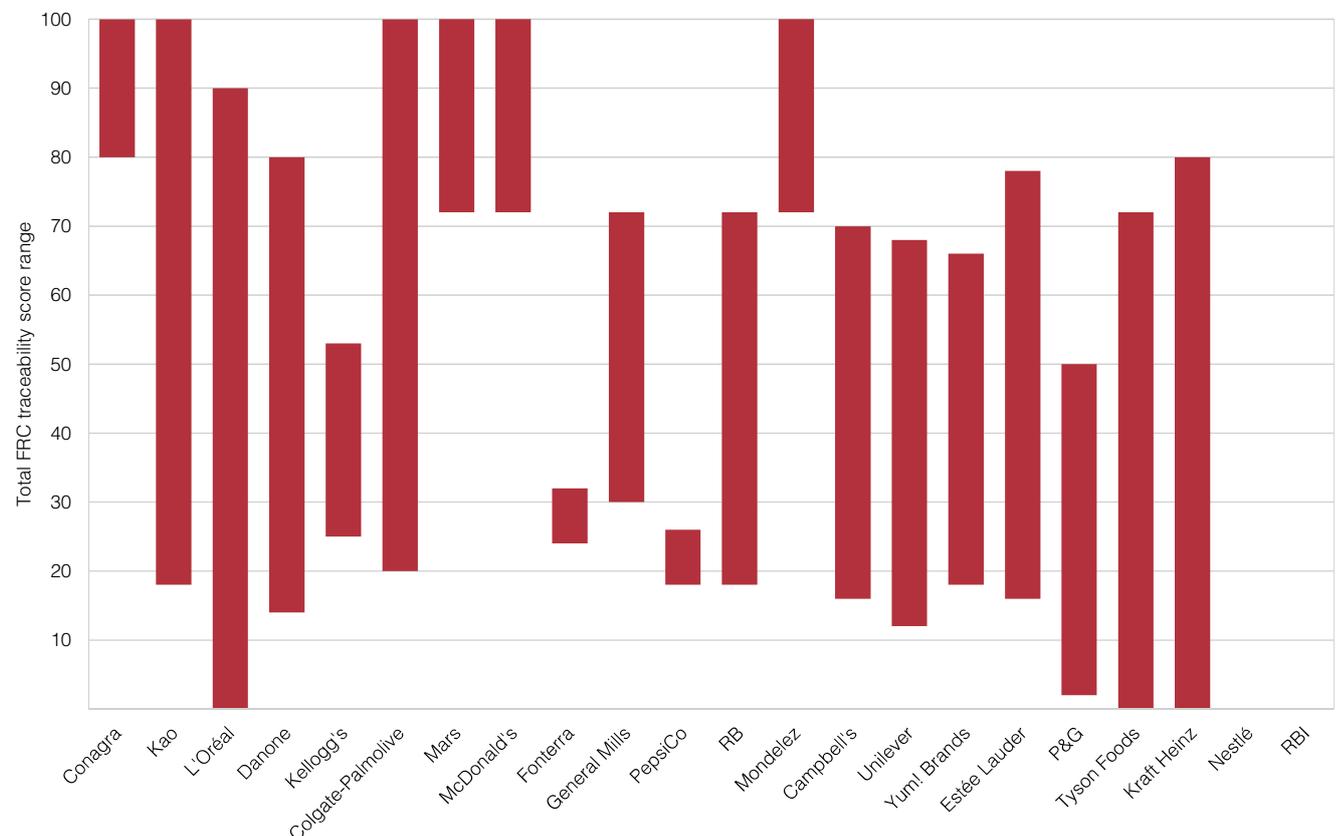
**Figure 16: Supply chain transparency - best and worst performers**

	Palm Oil	Soy	Timber	Cattle	Overall
<b>Highest clarity</b>	P&G	Danone	Kao, Kellogg Company, Conagra	Tyson Foods	1. Conagra 2. Danone 3. P&G
<b>Lowest clarity</b>	Tyson Foods, Restaurant Group	RB, McDonald's	Unilever, Mars, Fonterra	Campbell Soup, RB	20. Tyson Foods 21. Kraft 22. RBI

Source: CDP, company reports

- Conagra came out top and reported 100% traceability to the mill / forest management unit / slaughterhouse for all its Forest Risk Commodity exposures. Kao and Kellogg's trace 100% of their supply of pulp and paper to the forest of origin.
- RBI and Kraft Heinz rank poorly with no disclosure on actions taken on traceability.
- Nestlé has an ambitious target of tracing the source of all its FRCs down to the forest / farm / plantation level by using technologies such as Supply Shift and Achilles. The company traces just 60% of its palm oil supply, well behind most companies who are able to trace more than 90% of their palm supply to the mill of origin.
- L'Oréal together with Danone are the only companies to trace soy supply to the farm of origin. The L'Oréal Solidarity Sourcing Project in Brazil and Paraguay has largely contributed to L'Oréal's success, and accounts for 80% of the company's procurement of soybean oil.
- More than 30% of companies with exposure to soy and cattle do not provide disclosure on traceability.

**Figure 17: Range of traceability across FRCs**



Source: CDP, company reports

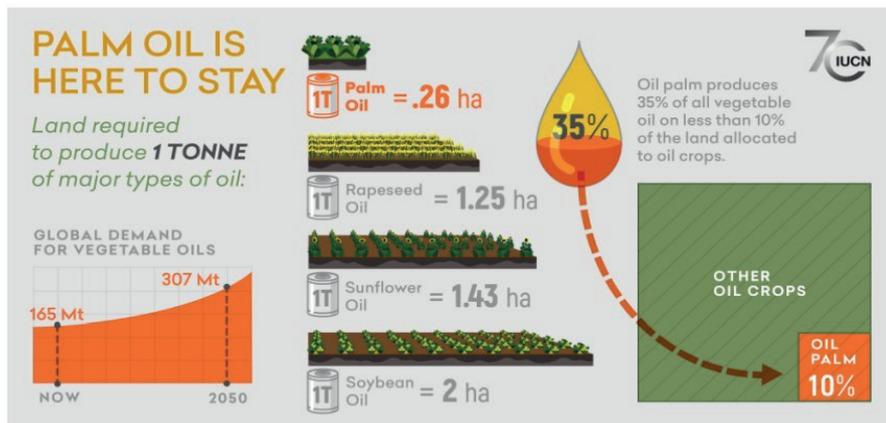
# Palm oil: complex but ripe with opportunities

## Substitution is not a solution

In April 2018, UK supermarket chain Iceland committed to remove palm oil from 100% of its own brand products. The retailer has faced difficulties in sourcing deforestation free palm oil and aimed to substitute palm oil with alternatives<sup>(11)</sup>. While substitution may be a good solution for managing negative environmental impacts associated with other commodities - such as substituting meat for plant-based alternatives - vegetable oils will likely drive more environmental impacts than using palm oil.

Oil palm currently produces 35% of all vegetable oil on less than 10% of the land allocated to oil crops<sup>(12)</sup>. Substituting palm oil for alternatives such as soybean, rapeseed or sunflower oil would require more land to produce equivalent amounts of oil, leading to further deforestation and biodiversity loss.

Figure 18: Palm oil efficiency. Source: Palm oil and biodiversity



Source: IUCN

## Is certification working?

Corporate disclosure through CDP's forests questionnaire reveals that many companies are relying on certification through the Roundtable on Sustainable Palm Oil (RSPO) as a proxy for sustainable production. However, RSPO faces ongoing criticism on the rigor of its standard. In response, RSPO adopted new Principles & Criteria in November 2018 to improve certification to reflect stakeholders' expectations. The standard now includes: implementing a High Carbon Stock Approach to ensure no deforestation on certified palm oil farms; no new plantings on peat regardless of depth; no land clearing with fire; and requires mills to ensure legality of their palm oil fruit.

The audit process is critical to RSPO and all sustainable certification. However, the scheme has been questioned as some forest clearances have been permitted despite strengthening the standard. Nevertheless, compared to similar non-certified plantations, RSPO certified palm oil plantations have shown evidence of reduced deforestation rates<sup>(12)</sup>.

## An opportunity instead of a cost

There are two main challenges to increasing global uptake of certified palm oil: 1) stagnated demand for sustainable palm oil and; 2) a drop certification's price premium. While around 60% of global palm oil was covered by no-deforestation commitments in 2016<sup>(13)</sup>, only 19% of palm oil globally is certified by RSPO. Further, only 50% of RSPO certified palm oil was sold at a premium in 2018<sup>(14)</sup>. The premium for certified palm oil has dropped from \$50 per tonne in 2004, to \$1-\$30 per tonne in 2019 with the costs of production remaining \$8-\$12 above that of conventional palm oil<sup>(15)</sup>. It has been suggested that downstream consumer goods companies such as those in this report are unwilling to pay sustainable palm oil premiums, despite their public commitments to tackle deforestation potentially reducing price and demand<sup>(15)</sup>.

However, research suggests that consumers may be willing to pay more for sustainable alternatives, representing an opportunity for companies. Capitalizing on this trend, in November 2019, RSPO will implement a new rule of "shared responsibility" whereby consumer goods companies such as Unilever or Nestlé would be fined if they do not increase their certified palm oil procurement.

## The way forward

Demand for vegetable oil is predicted to nearly double by 2050<sup>(12)</sup> but substituting palm oil with alternatives will not necessarily end deforestation and biodiversity loss. To address palm oil related deforestation, investors should focus on supporting downstream companies to stimulate demand for sustainably produced oil palm and capitalizing on growing consumer appetite for sustainable products.

Investors can also actively promote action on deforestation amongst businesses. For example, prior to the strengthening of RSPO, Green Century Capital Management and the New York State Common Retirement Fund organized institutional investors representing nearly US \$5 trillion in assets under management to submit a letter to RSPO calling on it to "prohibit controversial and unsustainable practices, including deforestation and peatland clearance, for certified palm oil production"<sup>(16)</sup>. Investors can further ensure companies are using appropriate tools, such as the strengthened RSPO Principles & Criteria, and are reporting on their efforts via CDP.

(11) Iceland Foods Limited

(14) RSPO

(12) Meijaard, E. et al

(15) LBID

(13) Chain Reaction Research

(16) Green Century Capital Management

## Market volatility scorecard

Volatility in raw material prices impact profit margins, leaving companies unable to adjust planned sales and existing supply chains.

Margins will also be impacted if companies are made to pay large premiums for certified raw material. Certified palm oil trades at a premium of around US\$1-30 a tonne on non-certified palm oil. Palm oil contributes to as much as 10-30% of procurement costs for some companies and margins can be sensitive to market price volatility.

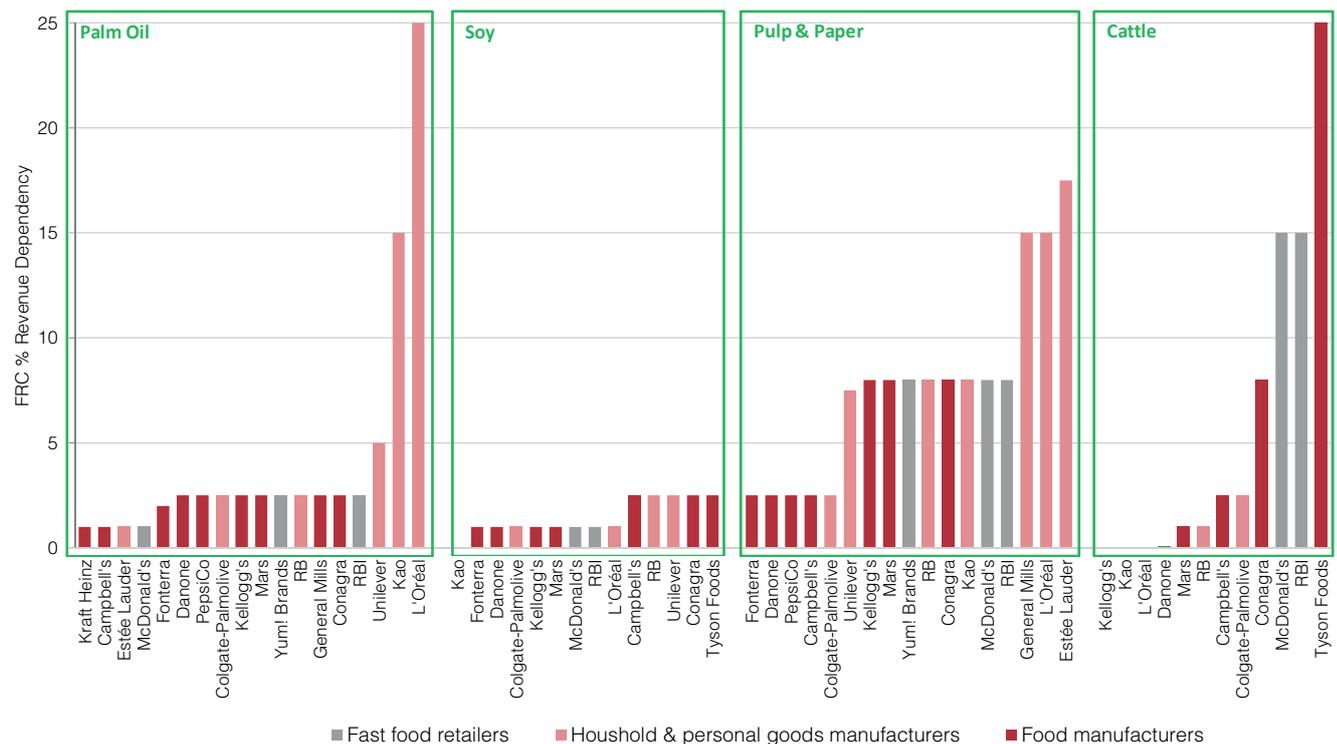
**Figure 19: FRC as a % of procurement costs**

	Palm Oil	Soy	Timber	Cattle	Overall
<b>Lowest reported % of Procurement Costs</b>	Kraft Heinz, Estée Lauder, Campbell Soup, McDonald's	Kao		L'Oréal, Kellogg Company, Kao	1. Kraft 2. Fonterra 3. Campbell's
<b>Highest reported % of Procurement Costs</b>	L'Oréal, Kao		Estée Lauder, General Mills, L'Oréal	Tyson Foods, RBI, McDonald's	20. RBI 21. L'Oréal 22. Tyson Foods

Source: CDP, company reports

- ▼ Tyson Foods has the highest exposure to FRC price volatility and reported 30-40% contribution to procurement costs from beef. McDonald's and RBI also reported 10-20% procurement cost contribution from beef.
- ▼ Palm oil-based materials represent 20-30% and 10-15% of L'Oréal and Kao's procurement costs respectively. L'Oréal's exposure is mostly due to more expensive palm oil derivatives, Kao's volumes are split equally between palm oil derivatives and palm kernel oil.
- ▼ Timber represent more than 10% of procurement costs at L'Oréal, Estée Lauder and General Mills.
- ▼ Fonterra, Campbell Soup and Danone have little cost exposure to FRCs and top the group.

**Figure 20: Market price volatility impact**



Source: CDP, company reports

## Regulatory risk scorecard

Recognised certification schemes can provide companies a means to counter increased scrutiny and regulatory risk. Recognised certifications are the RSPO for palm oil, RTRS or Proterra for soy and the PEFC or FSC for paper. There is currently no certification authority for cattle, although Conagra sources a portion of its beef using the Roundtable for Sustainable Beef Sustainable Framework and Tyson Foods through the Progressive Beef program.

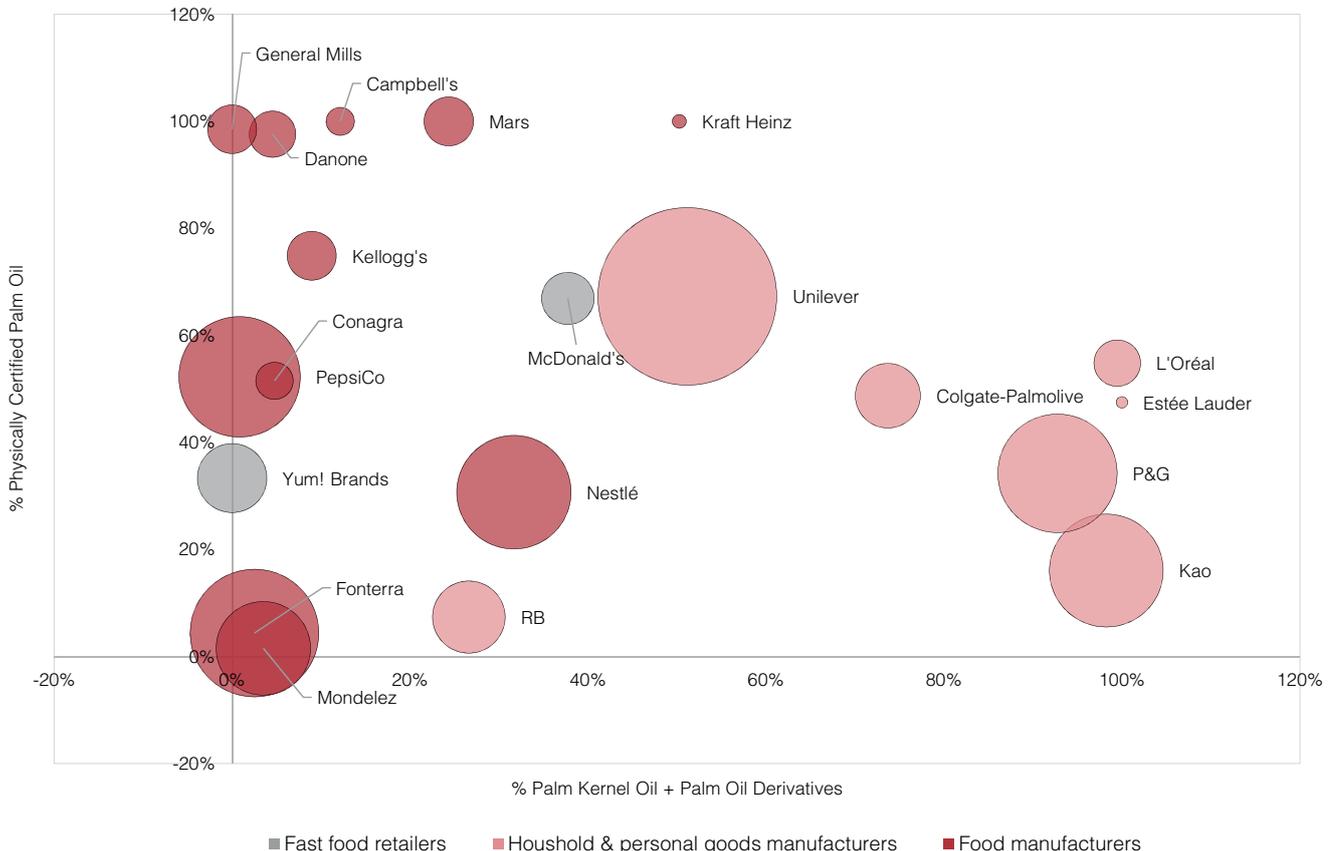
**Figure 21: Regulatory risk - best and worst performers**

	Palm Oil	Soy	Timber	Cattle	Overall
<b>Lowest degree of Regulatory Risk</b>	Mars, Kraft Heinz, Campbell Soup	Mars, Colgate-Palmolive	Kellogg Company, Unilever, L'Oréal		1. Danone 2. Unilever 3. Kellogg's
<b>Highest degree of Regulatory Risk</b>	Tyson Foods, Mondelez, RB		Estée Lauder		20. Mondelez 21. Tyson Foods 22. RBI

Source: CDP, company reports

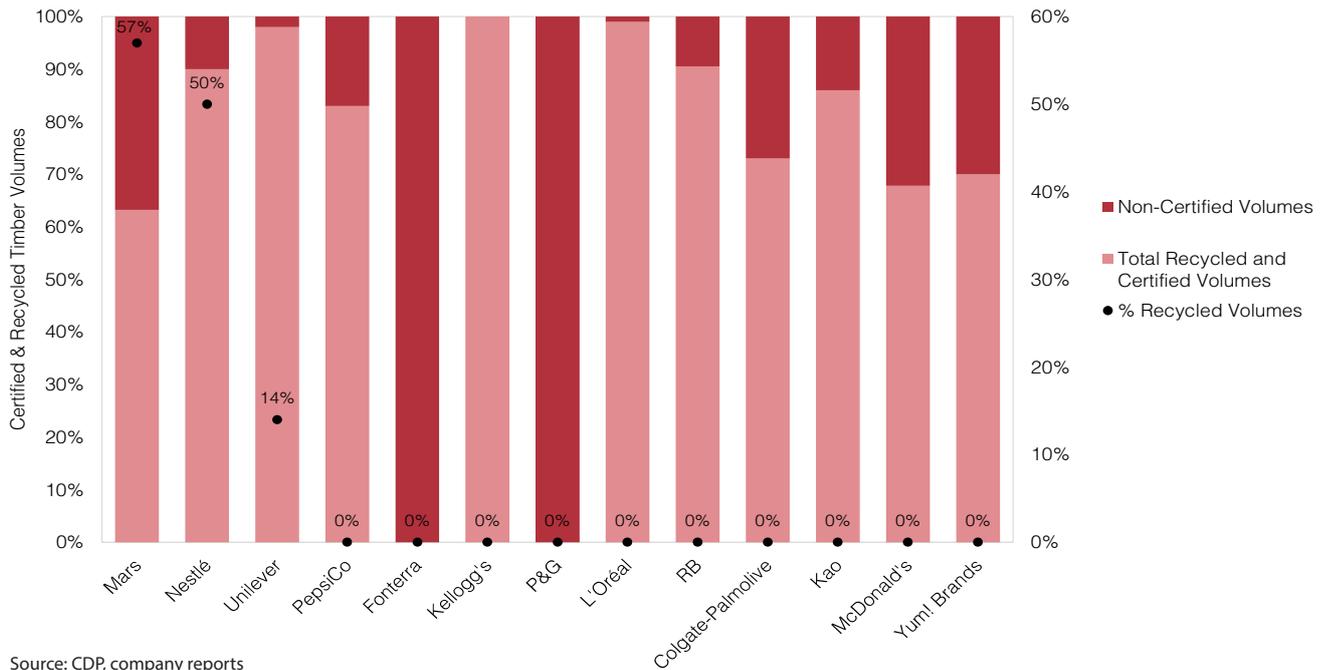
- ▼ Danone comes top on this metric, certifying more than 98% of its palm oil supply, and 79% of its paper supply.
- ▼ RBI, Tyson Foods, Mondelez and Fonterra all physically certify less than 5% of the palm oil volumes. Mondelez covers 98% of its supply through less accepted Book and Claim credits.
- ▼ Companies requiring palm kernel oil / palm oil derivatives are falling significantly short of 100% certified volumes due to the shortage of certified volumes.
- ▼ Most companies aim for fully physical segregated oil in their palm oil supply. Mars, Kraft Heinz and Campbell Soup are the only companies achieving 100% physically certified palm oil.
- ▼ 25% of companies did not provide disclosure on the proportion of FSC / PEFC certified or recycled paper in their paper and pulp supply. The reported level of certified or recycled paper or pulp ranged from 63-100% for companies providing disclosure and only four companies provide disclosure on recycled paper use. Kellogg Company was the only company with full certification for its paper and pulp consumption.

**Figure 22: Relationship between % physically certified palm oil & % palm kernel/palm oil derivatives sourced**



i) Bubble size: larger bubble size - larger volume of palm oil products utilised  
 ii) Physical certification refers to palm oil supply that has achieved Mass Balanced (MB), Identity Preserved (IP) or Segregated Certification according to the RSPO  
 iii) Source: CDP, RSPO, company reports

**Figure 23: Certified and recycled volumes of timber**



Source: CDP, company reports

## Capital resilience

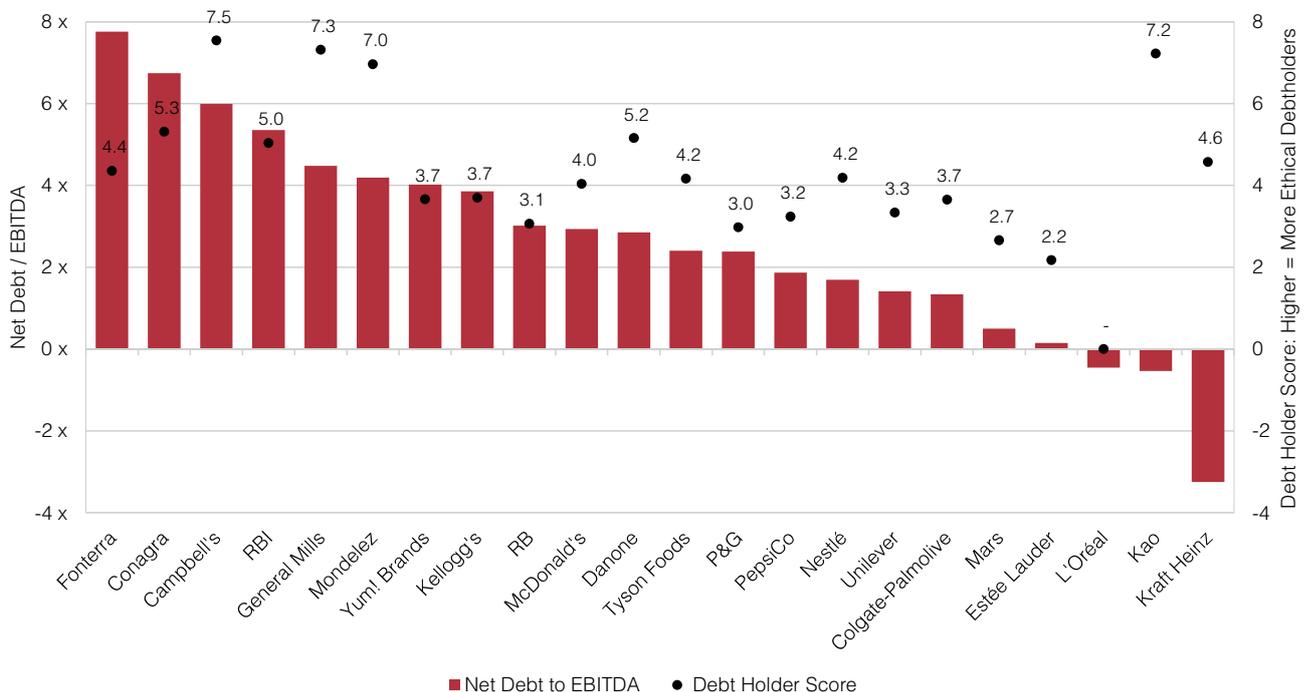
Our analysis of capital resilience is based on financial sub-metrics assessing leverage, free cash flow conversion and profitability.

Major banks have signed up to the Soft Commodities Compact initiative, jointly launched by the Consumer Goods Forum and Banking Environmental Initiative in 2014, with a focus on the food and timber commodities that have the highest impact on deforestation.

Although the focus has been on the upstream producers so far, increased scrutiny of the sector could identify palm supply chain risks for these companies and impact credit ratings.

- Of the 22 companies in the group, 6 of them have a leverage of more than 4x net debt / EBITDA, Fonterra, Conagra, Campbell's, RBI, General Mills and Mondelez.
- Whilst not scored on this metric, we looked at the debt-holder exposure of the group. We highlight companies with significant debt ownership by financial institutions with a rating of more than 20 on the Forest 500 financial institution list; these include Campbell Soup (17.7%), Mondelez (15.9%) and General Mills (17.2%).

**Figure 24: Financial leverage**



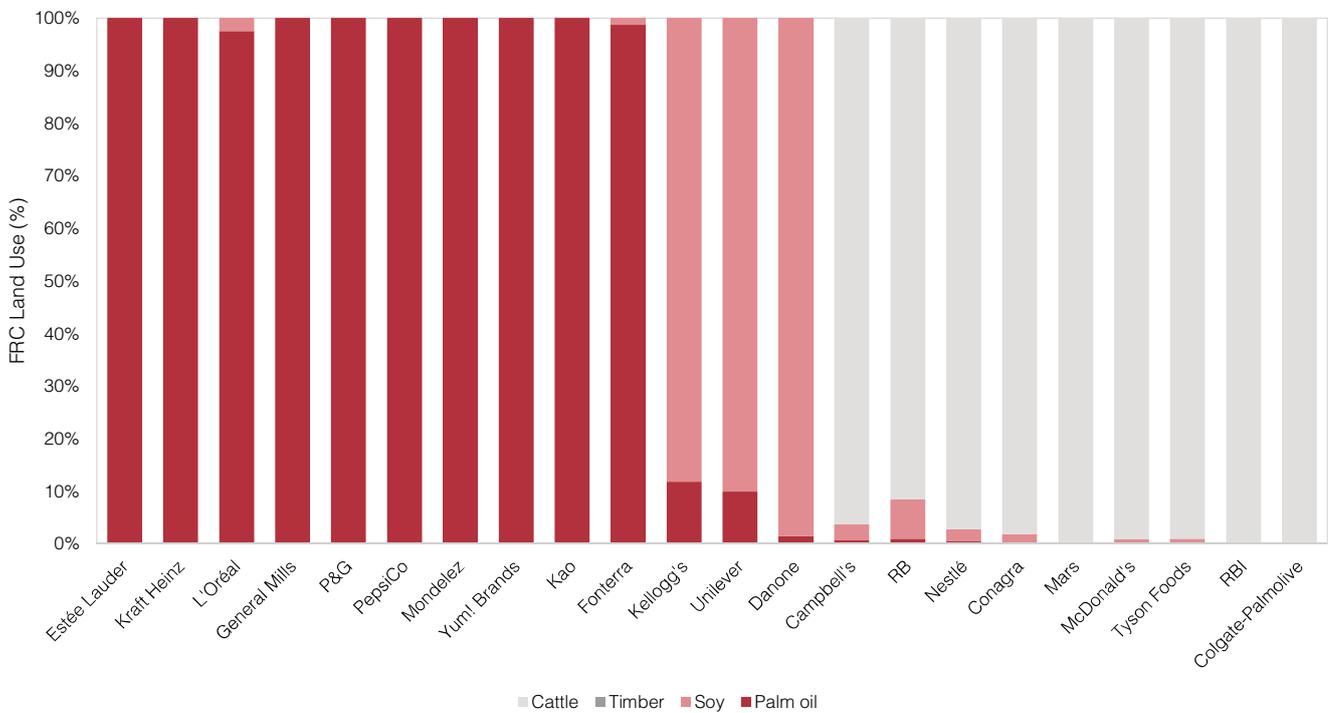
Source: CDP, company reports

## Land use scorecard

Land required to produce raw materials for products puts significant pressure on planetary resources. This metric evaluates the amount of land required to produce the FRCs required by each company.

- Companies without exposure to cattle score better on this metric due to the large amount of land required in cattle ranching.
- 0.024 tonnes of beef can be produced on a hectare of land in countries with developed cattle industries. This compares with 3.8 tonnes per hectare of palm oil and 1.6 tonnes per hectare yielded in the cultivation of palm oil and soybeans respectively.
- Tyson Foods fares poorly on this metric due to the high volume of beef required in its operations as does McDonald's.
- Colgate-Palmolive also ranks badly due to its high exposure to tallow; on average, a cow produces 310kg of beef and 40kg of tallow.

**Figure 25: FRC contribution to land use**



Source: CDP, company reports

## Physical risks

- ▼ Close to 90% of global palm oil production is concentrated in Southeast Asia along low lying areas exposed to sea levels and coastal flooding. The flooding of these existing plantations could jeopardise supply of raw material and risk further deforestation inland.
- ▼ Production is spread out across geographies for soy and cattle therefore the impact of climate change is more variable.

### Overview

The physical risks of climate change potentially expose consumer goods and fast food companies to the risk of further deforestation from FRCs used in their supply chains. Climate change is predicted to increase volatility in global agricultural and forestry production and will reduce yields in some areas where soy, cattle, palm oil and timber are currently farmed. At the same time, changing climatic conditions are likely to make some areas more suitable for production across the four FRCs. This combination of decreased productivity and emerging new areas of production pose a risk of further deforestation as new pastures, farms and plantations are established by clearing natural forests. This section explores the vulnerability of each FRC to the effects of climate change to understand the potential risk of further deforestation. A holistic value chain approach is used to analyse companies' use of each FRC and explore the potential risk of future deforestation.

Timber, cattle, oil palm and soy each have varying climatic requirements for production and climate change is therefore projected to affect each FRC differently.

- ▼ Oil palm production is currently restricted to hot, wet, tropical regions. The total area suitable for production is set to decrease under current climate change projections due to coastal flooding, drought and forest fire.
- ▼ Soy is currently grown throughout temperate and tropical regions with climate change predicted to increase risks of drought, flood and forest fire. This will shift production out of the tropics to regions further north and south of the equator.
- ▼ Cattle production is sensitive to drought, forest fire and flooding which affect the availability of drinking water, feed and forage crops. Climate change projections suggest cattle will move from increasingly unsuitable arid and semi-arid regions to humid, temperate regions.
- ▼ Timber production is affected by flood and storm risk and climate change is projected to increase the frequency and intensity of flooding and wind speeds in some areas which may shift production to areas less at risk.

For oil palm, soy and cattle, risks associated with forest fires and water-related drought and flood risk were assessed using commodity level data from World Resources Institute (WRI) and Global Forest Watch (GFW).

For timber, risks associated with flooding were assessed using country-level data from WRI, whilst risks associated with storms could not be analysed due to a lack of quality global climate modelling data for storms and wind.

To some extent companies can manage these risks of further deforestation by engaging with suppliers, NGOs and governments to develop climate-resilient agricultural techniques and crop or livestock varieties, reducing yield losses. Investing in better climate risk mapping may also help companies and suppliers manage any shifts in production to ensure that newly established pastures, farms and plantations are in areas at low risk of climate change impacts and do not encroach on forests. These measures may help to minimize future risks of deforestation, but companies may never fully remove deforestation from their supply chains.

Each of the FRCs were assessed for future deforestation risk as follows:

**Metric 1) Oil palm (50%):** This metric identifies the risk of further deforestation from shifting palm oil production by exploring drought, coastal flood and forest fire risk to companies' current oil palm sources. This analysis highlights where oil palm plantations are likely to become unproductive in the future, producing a weighted score for the risk of further deforestation from oil palm production moving into new areas.

**Metric 2) Soy (20%):** This metric assesses the risk of future deforestation from moving soybean production by evaluating the risk of drought, flood and forest fires to companies' current sources of soy. This shows which areas of soybean production are at risk of becoming unproductive, creating a weighted score for the risk of further deforestation from soy production expanding into new areas more suitable for cultivation.

**Metric 3) Cattle (20%):** This metric evaluates the risk of further deforestation from shifting cattle farming by assessing drought, flood and forest fire risk to companies' current cattle supply. This highlights where cattle production is at risk of becoming unproductive, generating a weighted score of the risk of cattle production causing further deforestation as it relocates to new, more productive areas

**Metric 4) Timber (10%):** This metric explores the risk of further deforestation from movement in timber production by evaluating the flood risk posed to companies' current timber supply. This produces a score for the risk of further deforestation from timber production as it shifts to more suitable areas.

## Overall highlights

### Palm oil

- Companies disclose the most detailed data for oil palm product sourcing, largely in the form of company-specific palm oil mill lists, allowing for location-specific physical risk analysis.
- All 22 companies have palm oil in their supply chains and 15 of these companies have made publicly available their palm oil mills lists or supplier lists. This included seven food manufacturers and five personal care and consumer goods companies. No fast food retailers disclosed palm oil mill lists.
- Oil palm production is highly concentrated, with over 80% taking place in Indonesia and Malaysia. This means that all companies are highly exposed to the physical risks of climate change and further deforestation. The biggest physical risk for this commodity is coastal flooding, with a significant proportion of current oil palm production located in low-lying coastal areas.
- Mondelez and Unilever lead the group, sourcing from areas with the lowest exposure to forest fire, drought and coastal flooding risk, and therefore the lowest risk of triggering further deforestation from oil palm in their supply chain.

### Soy

- Only 10 out of 21 companies disclosed country-level data on soy sourcing; eight food manufacturers and two personal and household goods companies.

- Campbell Soup, Danone, Tyson and Conagra lead the group, as they source all their soy from North America and/or Europe, regions which have relatively low risk of drought, flooding and forest fire.

### Cattle

- Six companies disclosed country-level data on cattle sourcing, including four food manufacturers and two consumer goods companies. No fast food retailers disclosed country-level sourcing data, despite the use of beef in many of their core products.
- Tyson leads the group because it sources its beef from the US and Canada, both of which have relatively low risk of climate change impacts.
- Other companies performed less well, as they sourced cattle from South American countries with higher risk of climate change impact.

### Timber

- Only 14 companies provided country-level data on their timber sourcing.
- Conagra, Kao and Fonterra perform the best, because a large proportion of the timber they use is likely to be produced in the US, which is at relatively low risk from drought, flood and forest fire.
- Colgate-Palmolive, RB and Mars perform the worst, and are sourcing from a wide range of countries, including those at high risk of climate change impacts such as Brazil and Argentina.

Figure 26: Physical risk summary

Company	Palm risk	Soy risk	Timber risk	Cattle risk	Overall weighted rank	Physical risk rank
Mondelez	2				4.4	1
Mars	5	11	3	4	5.5	2
Colgate-Palmolive	5	9	7	5	5.6	3
Unilever	3	7	9	16	5.8	4
Danone	5	3	4	16	5.9	5
Nestlé	6	9	5	5	6.3	6
Kellogg's	7	8	4		6.9	7
L'Oréal	9	6	6		8.2	8
RB	9	10	5	6	8.3	9
P&G	11				9.8	10
Campbell's	15	2	3	4	10.0	11
General Mills	7	18	8	16	10.1	12
PepsiCo	9	18	8	16	11.2	13
Fonterra	14	8	2		11.2	14
Conagra	19	3	1	3	12.4	15
Tyson Foods	19	3	10	1	13.0	16
Kraft Heinz	14	18	10	16	14.3	17
McDonald's	19	13	6	6	15.0	18
Kao	19		2		16.6	19
Estée Lauder	19	18	1		16.7	20
Yum! Brands	19	18	7	16	17.1	21
RBI	19	18	10	16	17.4	22
<b>Weighting</b>	<b>60%</b>	<b>15%</b>	<b>10%</b>	<b>15%</b>		

Note: Averages were used to calculate scores for P&G and Mondelez Soy and Timber risk as publicly available data is currently unavailable. Where other scores have been left blank, companies do not have exposure to these FRCs and therefore were not scored.

In calculating the weighted rank in this table, we use the weighted ranks for each area. We display non-weighted ranks in this summary for simplicity only

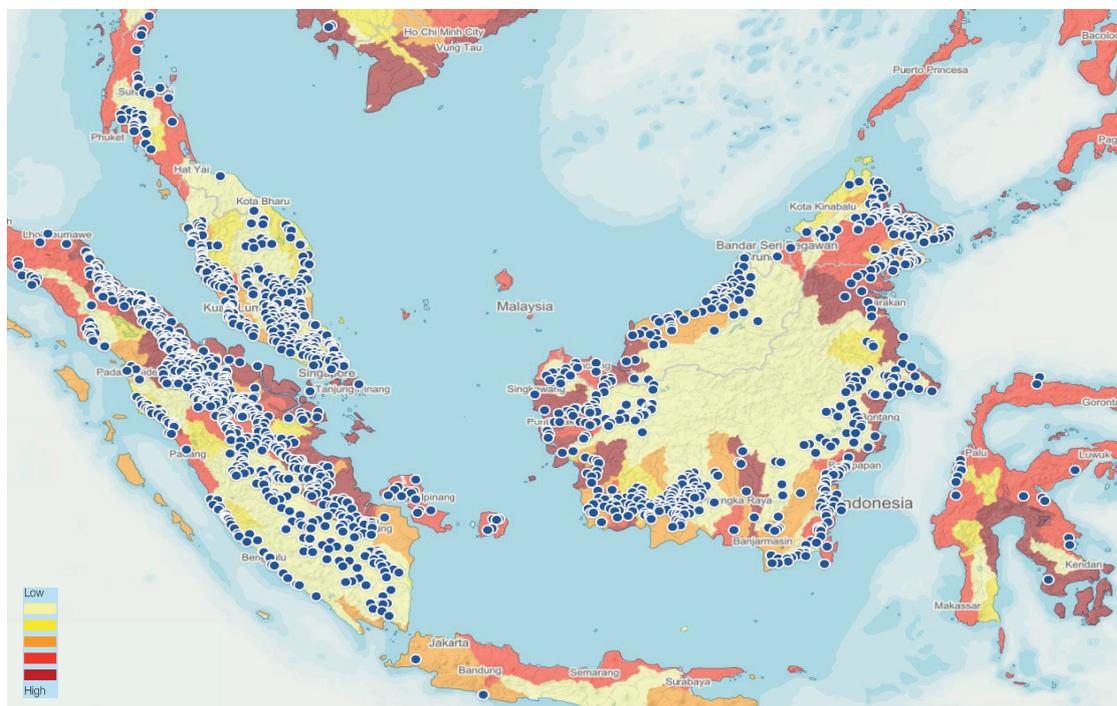
Source: CDP

## Palm oil physical risks

Oil palm production is highly vulnerable to the impacts of climate change, posing a risk of further deforestation as production shifts to new areas. Oil palms grow best in the tropics, at temperatures between 24 - 33°C, with high rainfall (2000-2500mm) and ample sunlight<sup>(17)</sup>. As a result, production is highly concentrated, with Malaysia and Indonesia accounting for over 80% of global oil palm production<sup>(2)</sup>.

Climate change is projected to decrease the total area suitable for oil palm production and reduce yields in many current regions of production<sup>(18)</sup>. Some new areas are also predicted to become suitable for oil palm production, particularly areas further from the equator and at high elevation. However, this will not compensate for the overall loss of area suitable for production and will increase the risk of further deforestation, as many of these areas are also where remaining tropical forests are located. Oil palm plantations take around five years to become productive, from germinating seeds to fully grown oil palms. The time required to establish new oil palm plantations in response to the effects of climate change could therefore increase the instability of global production, unless the movement in oil palm production is well-managed.

**Figure 27: Location of palm oil mills in Indonesia and Malaysia**



Source: WRI, Global Forest Watch

There are several key environmental and climatic factors that will impact the distribution of future oil palm production. This analysis evaluates the risk of flood, drought and forest fire to companies' current palm oil supply:

**Flood risk (40%):** Oil palm plantations are mainly located in low-lying areas and coastal flooding could cause severe yield loss in coastal plantations; in Malaysia up to 100,000ha of coastal plantations could be flooded<sup>(19)</sup>. Companies' palm oil mill or supplier lists are mapped against the 'WRI Aqueduct Water Risk Atlas' dataset to assess the risk of coastal flooding to companies' supply.

**Drought risk (40%):** Palm oil is highly sensitive to droughts which are predicted to become more frequent in some areas as a result of climate change, causing significant yield losses. Drought risk is analyzed here by mapping companies' palm oil mill or supplier lists against the 'WRI Aqueduct Water Risk Atlas' dataset.

**Fire (20%):** In some locations, reduced rainfall and dryer conditions will increase the frequency and intensity of fires on palm oil plantations, leading to yield losses and posing a health risk to farmers, workers and local communities. Companies' palm oil mill or supplier lists are mapped against forest fire risk using the 'GFW Global Fire Report' dataset.

Companies dependent palm oil can manage these risks by engaging suppliers to develop agricultural practices which sustainably intensify yields, as well as investing in developing more climate-resilient crop varieties. However, the future security of production relies on any new plantations being located in areas with limited negative impacts from climate change, or where climatic conditions will improve for oil palm production.

(17) Fleiss et al., Potential Impacts of Climate Change on Oil Palm Cultivation

(18) Paterson, RRM and Lima, N, Climate change affecting oil palm agronomy, and oil palm cultivation increasing climate change, require amelioration

(19) Siwar et al., Climate change, agriculture and food security issues: Malaysian perspective

## Palm oil key findings

- ▼ All 22 companies use oil palm in their products but only 15 publicly disclosed palm oil mill lists or palm oil suppliers. This included seven food manufacturers and five personal care and consumer goods companies. No fast food retailers disclosed this level of detail on their palm oil sourcing.
- ▼ Three companies, Fonterra, Campbell Soup and Kraft Heinz did not provide mill lists specific to their operations but provided their main palm oil product suppliers. As a result, the analysis of these companies includes mills that may not be part of their supply chain, and their overall scores have been weighted accordingly.
- ▼ Mondelez and Unilever lead the group, sourcing from areas with the lowest exposure to forest fire, drought and coastal flooding risk, and therefore have the lowest risk of triggering further deforestation from oil palm in their supply chain.

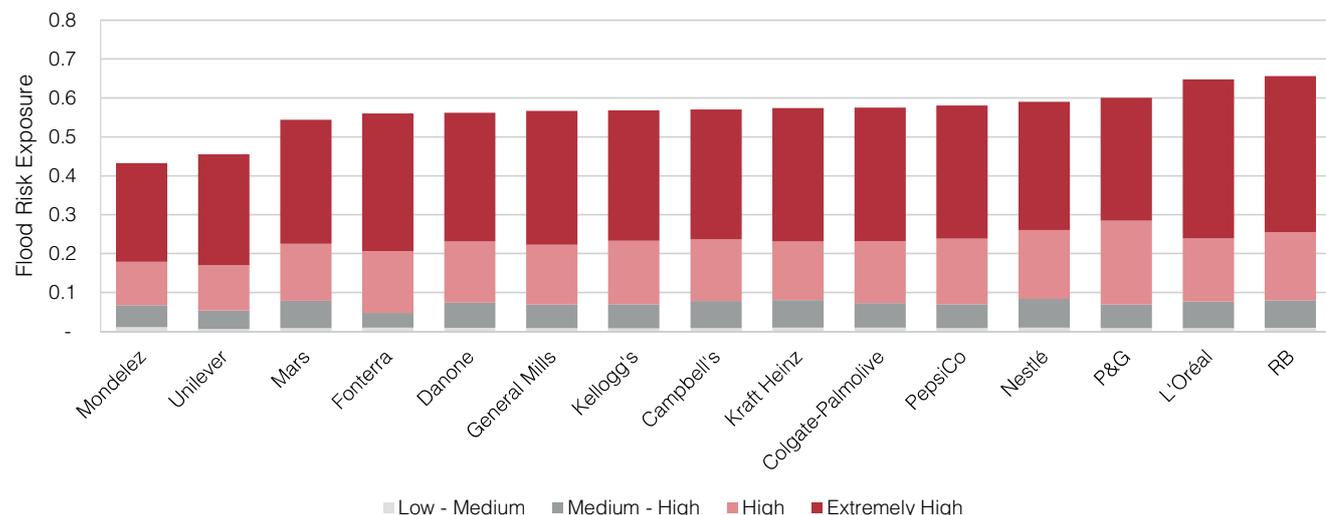
**Figure 28: Palm oil mill list data quality**

Company	Company-specific list	Independently verified list	RSPO certification status	Coordinates provided
Unilever	✓	✓	✓	✓
General Mills	✓	?	✓	✓
Danone	✓	?	✓	✓
RB	✓	✓	✗	✓
L'Oréal	✓	✓	✗	✓
Colgate-Palmolive	✓	?	✗	✓
Kellogg's	✓	?	✗	✓
PepsiCo	✓	✗	✗	✓
Mondelez	✓	?	✗	✓
Mars	✓	?	✗	✗
Nestlé	✓	?	✗	✗
P&G	✓	?	✗	✗
Fonterra	✗	N/A	N/A	N/A
Campbell's	✗	N/A	N/A	N/A
Kraft	✗	N/A	N/A	N/A

Source: CDP, company reports

- ▼ 85% - 100% of reporting companies' palm oil mills are in Indonesia and Malaysia, mirroring global production patterns. This also means that companies are all exposed to relatively similar physical risks of climate change and deforestation.
- ▼ The proportion of mill sites at a high risk of forest fire was relatively similar across companies, ranging from 16% – 20%. This is because most companies' mills are located in the same areas of Indonesia and Malaysia, and forest fire risk across these areas is relatively homogenous. Engaging with farmers and local people about the danger of using fire to clear land, as well as helping to support community-based emergency fire services could help companies to manage this risk.
- ▼ Companies are sourcing from area at a very high risk of coastal flooding, with many mills and plantations in Indonesia located on coastal flood plains. This poses a significant risk to palm oil supply and further deforestation if production is forced to move to upland areas, yet no companies have published details about how this risk may be managed.

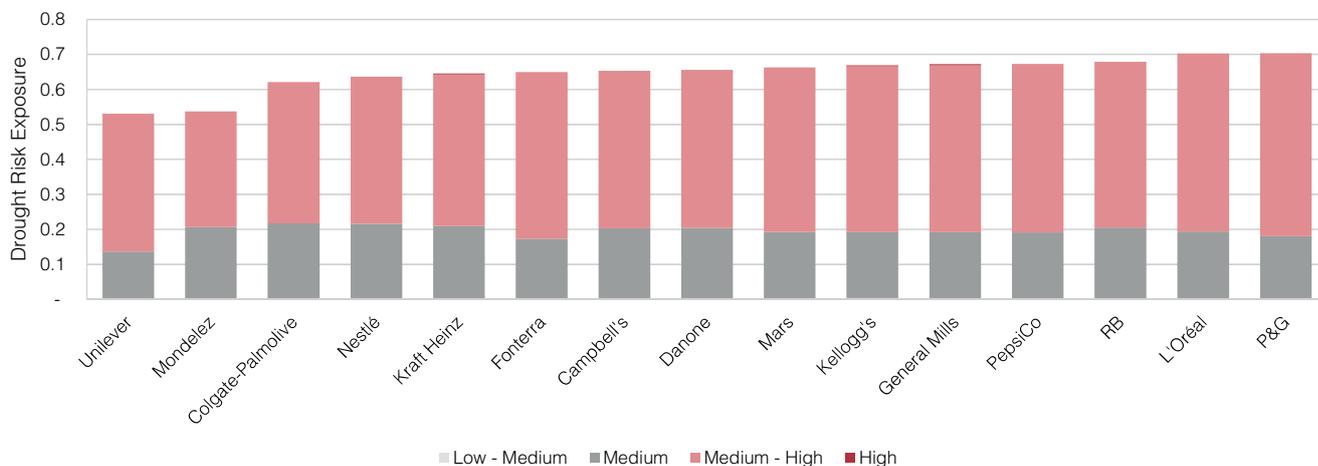
**Figure 29: Palm oil flood risk**



Source: CDP, WRI, company reports

Companies are sourcing palm oil from regions at medium to high risk of drought. Oil palms require consistently high rainfall throughout the year and are highly sensitive to drought. Developing irrigation systems for palm oil could offset low and irregular rainfall caused by climate change. This will have to be managed sustainably so as not to decrease water availability for local communities and other local agricultural systems or ecosystems.

**Figure 30: Palm oil drought risk**



Source: CDP, WRI, company reports

## Soy physical risks

Soybeans are grown throughout the tropics and temperate regions. Whilst the crop is native to East Asia, selective breeding and genetic modification has increased soy's growing range. However, production is highly concentrated, with just three countries (US, Brazil and Argentina) responsible for over 80% of global production<sup>(2)</sup>.

Soy production is highly sensitive to drought and flooding, particularly as many soy farms are situated on river flood plains. In Southern America, soy production is also at high risk of forest fires, with farms situated in previously forested areas. Climate change is set to increase these environmental risks in these areas, decreasing yield by 15-30% and pushing production further north and south towards the poles<sup>(20)</sup>. Unless managed, shifting production could trigger further deforestation as new areas become more suitable for production.

This analysis considers the risk of drought, flood and forest fire to companies' current soy supply:

**Flood risk (40%):** Increasingly unpredictable rainfall patterns exposes soy to higher risks of flooding in many regions, leading to significant crop losses, especially in South America. The areas companies are sourcing from are mapped against the 'WRI Aqueduct Water Risk Atlas' dataset to assess the risk of coastal flooding to companies' supply.

**Drought risk (40%):** Soy is highly sensitive to drought, particularly in South America where much production is rain fed. This is predicted to become more frequent in some areas as a result of climate change, leading significant yield losses. Drought risk is assessed by mapping the areas companies source soy from against the 'WRI Aqueduct Water Risk Atlas' dataset.

**Fire (20%):** In some locations, reduced rainfall and dryer conditions will increase the frequency and intensity of fires on soy farms, leading to yield losses and posing a health risk to farmers, workers and local communities. The areas companies source soy from are mapped against the Fire risk is evaluated using the 'GFW Global Fire Report' dataset to evaluate forest fire risk.

Companies could engage suppliers to manage these risks, helping them to sustainably intensify yields and investing in the development of climate-resilient soy varieties. However, as with oil palm, the future security of soy production requires new farms to be located in areas which will experience limited negative impacts of climate change, or where climatic conditions will improve. Companies could help to undertake research to understand where these areas overlap with areas of low forest cover to limit further deforestation as new farms and plantations are established.

## Soy key findings

- Only 10 out of 21 companies disclosed country-level data on soy sourcing: eight food manufacturers and two personal and household goods companies.
- Very few companies disclosed the volumes of soy sourced from different countries and as such, global production averages were used to assess the environmental risks.

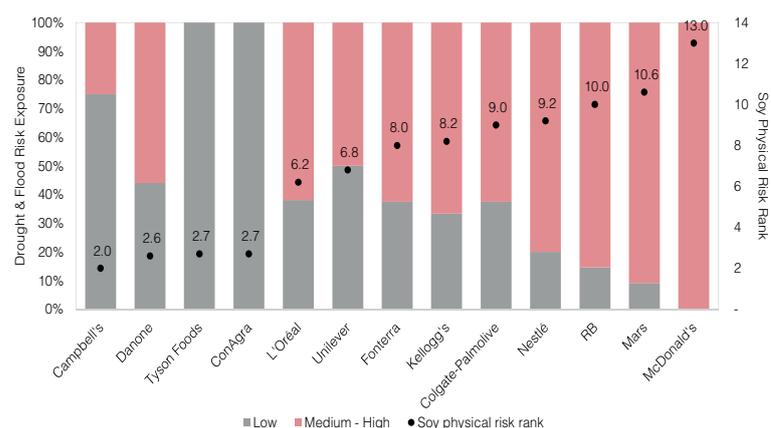
(20) Deryng et al., Simulating the effects of climate and agricultural management practices on global crop yield

**Figure 31: Soy exposure to high risk regions**

Company	Company list	Independently verified list
Campbell's	✗	✗
Danone	✗	✗
Tyson Foods	✗	✗
Conagra	✗	✗
L'Oréal	✗	✓
Unilever	✗	✓
Fonterra	✗	✓
Kellogg's	✗	✓
Colgate-Palmolive	✓	✓
Nestlé	✓	✓
RB	✓	✓
Mars	✓	✓
McDonald's	✓	✓
PepsiCo	No data	No data
Mondelez	No data	No data
Kraft Heinz	No data	No data
General Mills	No data	No data
Estée Lauder	No data	No data
Kao	No data	No data
P&G	No data	No data
Yum! Brands	No data	No data
RBI	No data	No data

Source: CDP, company reports

**Figure 32: Soy drought and flood risk and physical risk rank**



Source: WRI, CDP, company reports

- ▶ Campbell Soup, Danone, Tyson and Conagra lead the group, as they source all their soy from North America and/or Europe, regions which have relatively low risk of drought, flooding and forest fire.
- ▶ McDonald's, Mars, RB and Nestlé perform less well, largely due to sourcing from South America and China, where the risk of drought, flooding and forest fire are higher. Engaging with producers in these areas to develop more climate-resilient soy varieties and production techniques could help to reduce these risks.

## Timber physical risks

Timber production is relatively spread out, with 75% of timber produced across 14 countries<sup>(2)</sup>. 31% of the world's forests are designated for production and 28% is multiple-use forests, managed to produce a range of products and services<sup>(21)</sup>. Growing conditions for timber production vary hugely across the world, and so the effect of climate change and associated risks of further deforestation vary across global production. There is relatively little understood about how timber production will be impacted by climate change at the global scale. Timber is particularly affected by flood and storm risk and climate change is projected to increase the frequency and intensity of flooding and wind speeds in some areas which may decrease productivity<sup>(2)</sup>. Timber is particularly sensitive to climate change because trees' long lifespans mean that production cannot adapt quickly to changing climatic conditions. This poses a risk of deforestation to remaining natural forests which may be harvested to meet demand.

This analysis evaluated the flood risk to companies' current timber supply. Storm risk could not be evaluated due to the lack of reliable global climate modelling data.

**Flood risk (100%):** Climate change is projected to make rainfall patterns increasingly unpredictable, exposing timber production to higher risks of flooding in many regions, especially in tropical and sub-tropical regions. The areas companies are sourcing their timber from are mapped against the 'WRI Aqueduct Water Risk Atlas' dataset to assess the risk of coastal flooding to companies' supply.

Companies may be able to mitigate these risks by investing in research to understand how the sector will be impacted by climate change and work with suppliers to develop appropriate sustainable adaptation strategies to limit the risk of further deforestation. Climate change may affect the distribution of tree species, meaning some species will be unable to survive in new climatic conditions, whilst other new species will become better suited. However, new species will have to be actively planted as climate shifts in order to maintain timber production, something that companies could support producers to do.

## Timber key findings

- ▶ All companies use timber within their supply chains, including its use for paper and card packaging and in the form of shipping pallets, as well as the direct use of timber in products. 14 companies provided country-level data on their timber sourcing, including eight food manufacturers, five personal care and household goods companies and one fast food retailer (Yum! Brands).

(21) MacDicken et al., Global forest resources assessment 2015: how are the world's forests changing?

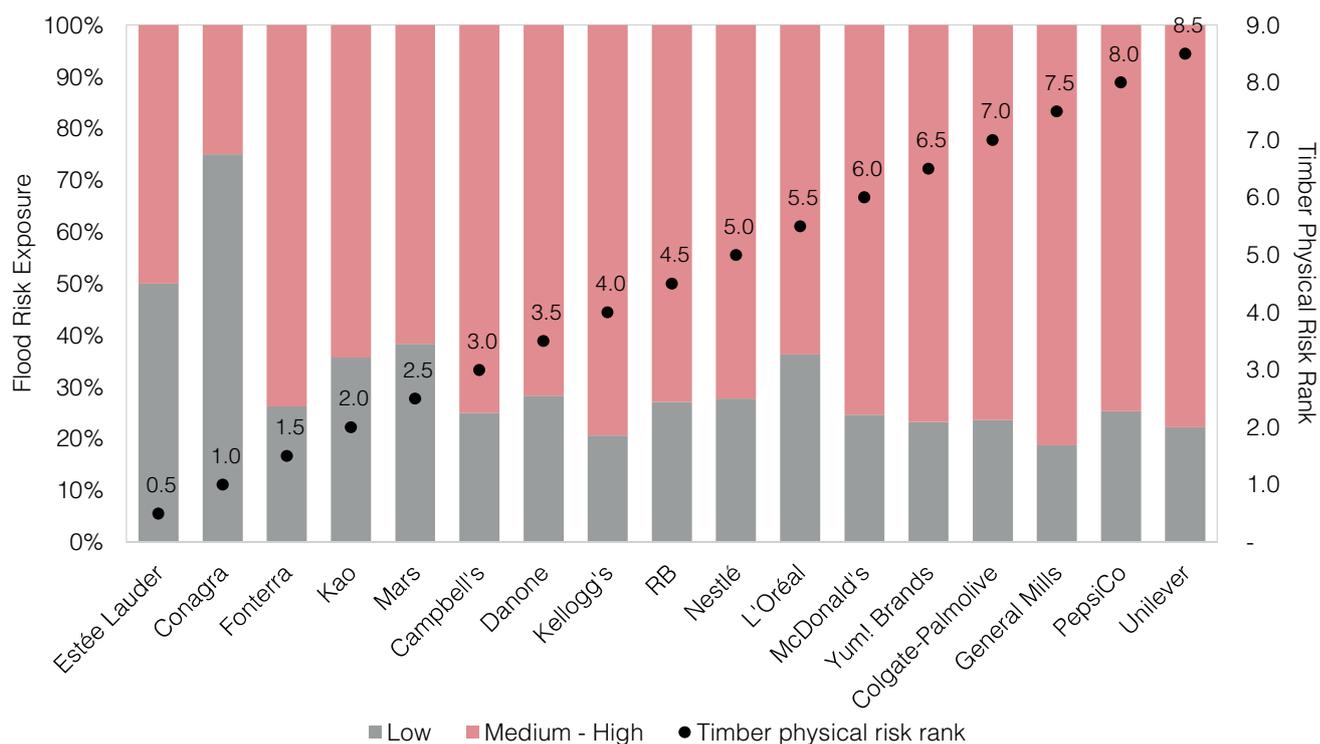
- Conagra, Kao and Fonterra perform the best, because a large proportion of the timber they use is likely to be produced in the US, which is at relatively low risk from drought, flood and forest fire.
- Companies performing the least well, including Colgate-Palmolive, RB and Mars are sourcing from a wide range of countries, including those at high risk of climate change impacts such as Brazil and Argentina. As a result, production is more likely to shift within these regions, triggering further deforestation.

**Figure 33: Timber exposure to high risk regions**

Company	Russia	Ukraine	Malaysia	Thailand	Brazil	Chile	Romania
Conagra	x	x	x	x	x	x	x
Kao	x	x	x	✓	x	x	x
Fonterra	x	x	✓	x	x	✓	x
Mars	x	x	x	x	✓	x	x
Campbell's	x	x	✓	x	✓	x	x
Danone	x	✓	x	✓	✓	x	✓
Estée Lauder	x	x	x	x	x	x	x
Kellogg's	x	x	✓	✓	✓	✓	x
Nestlé	✓	✓	✓	x	x	x	✓
L'Oréal	✓	x	x	x	✓	✓	x
McDonald's	✓	✓	x	✓	✓	✓	✓
Colgate-Palmolive	✓	x	✓	✓	✓	x	x
Yum! Brands	✓	✓	x	✓	✓	✓	x
General Mills	x	x	x	x	✓	x	x
RB	✓	x	x	✓	✓	x	✓
Unilever	✓	x	✓	✓	✓	✓	✓
PepsiCo	✓	✓	x	✓	✓	✓	✓
Tyson Foods	No data	No data	No data	No data	No data	No data	No data
Mondelez	No data	No data	No data	No data	No data	No data	No data
Kraft Heinz	No data	No data	No data	No data	No data	No data	No data
P&G	No data	No data	No data	No data	No data	No data	No data
RBI	No data	No data	No data	No data	No data	No data	No data

Source: CDP, WRI

**Figure 34: Timber flood risk and physical risk rank**



Source: CDP, WRI

## Cattle physical risks

Cattle production is also spread out, with 75% of production taking place in 26 countries<sup>(2)</sup> the impact of climate change varies considerably across geographies. Cattle production is significantly affected by drought, flooding and forest fires. Drought reduces the availability of drinking water and hotter temperatures increase the volume of water cattle need to consume. Both flood, drought and forest fires can reduce the quality and quantity of cattle feed and forage crops. Overall, these risks reduce cow's growth, milk production and ability to reproduce. Companies could manage these risks by working with producers to develop less water-intensive and more climate resilient cattle production systems.

This analysis considers the risk of drought, flood and forest fire to companies' current soy supply:

**Drought risk (40%):** Cattle are highly sensitive to drought, which is predicted to become more frequent with climate change, particularly in tropical and sub-tropical regions such as Central and Southern America and Sub-Saharan Africa. Drought risk is assessed by mapping the areas companies source cattle from against the 'WRI Aqueduct Water Risk Atlas' dataset.

**Figure 35: Cattle exposure to high risk regions**

Company	Argentina	Brazil
Tyson Foods	x	x
Conagra	x	✓
Campbell's	✓	✓
Mars	x	✓
Colgate-Palmolive	✓	✓
RB	✓	✓
Nestlé	✓	✓
McDonald's	✓	✓
Yum! Brands	No data	No data
Unilever	No data	No data
PepsiCo	No data	No data
Danone	No data	No data
Kao	No data	No data
Kellogg's	No data	No data
General Mills	No data	No data
Fonterra	No data	No data
Estée Lauder	No data	No data
Mondelez	No data	No data
Kraft Heinz	No data	No data
L'Oréal	No data	No data
P&G	No data	No data
RBI	No data	No data

Source: CDP, company reports

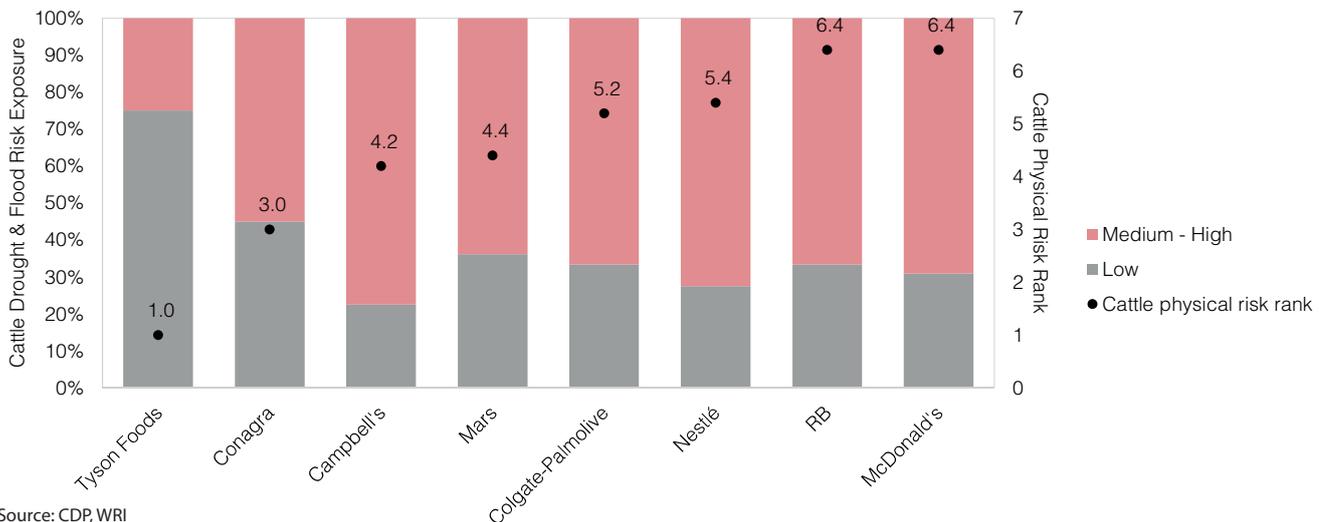
**Flood risk (40%):** Climate change is predicted to make rainfall patterns increasingly erratic, exposing cattle production to higher risks of flooding in many regions, especially in tropical and sub-tropical regions. The areas companies are sourcing their cattle from are mapped against the 'WRI Aqueduct Water Risk Atlas' dataset to assess the risk of coastal flooding to companies' supply.

**Fire (20%):** In some locations, reduced rainfall and dryer conditions will increase the frequency and intensity of fires around cattle farms, leading to yield losses and posing a health risk to farmers, workers and local communities. The areas companies source cattle from are mapped against the Fire risk is evaluated using the 'GFW Global Fire Report' dataset to evaluate forest fire risk.

### Cattle key findings

- Only six of these 19 companies disclosed country-level data on cattle sourcing, including four food manufacturers and two consumer goods companies. No fast food retailers disclosed country-level sourcing data, despite their use of beef in many of their core products.
- Tyson Foods leads the group, largely because it sources its beef from the US and Canada, both with relatively low risk of drought, flooding and forest fire.
- Other companies performed less well, as they sourced cattle from South American countries with higher risk of flooding, drought and forest fire.

**Figure 36: Cattle drought & flood risk and physical risk rank**



Source: CDP, WRI

## Transition opportunities

- ▼ Most companies are focused on supply side opportunities rather than demand side opportunities. On average companies have deployed almost three times the amount of sustainable production initiatives as sustainable consumption initiatives.
- ▼ 95% of companies in the group have developed initiatives on basic supplier capacity building. Over 60% have paired these basic engagement programs with the deployment of smart agri-tech and/or new seed varieties.
- ▼ Only eight companies were found to be deploying landscape style approaches or investing in regenerative agriculture.

### Overview

The transition to a sustainable food system requires collaborative and systemic action on the part of all the stakeholders operating within the current food system. Consumer Goods companies have an important role to play and must innovate both on the supply side and the demand side of the markets in which they operate. On the demand side, changing consumer preferences and mounting consumer pressure regarding deforestation provides opportunities for companies that can position their portfolios and brands as deforestation free.

Traditionally meat-based consumer facing companies Tyson, McDonald's and Yum! Brands have invested in plant-based alternatives, and Personal and Household Goods manufacturers have developed vegan ranges across their brands. Veganism is not just about reducing our intake of cattle, it's about reducing the amount of soymeal required for animal feed. Additionally, programs to engage with consumers to drive responsible consumption and reduce food waste are important. Currently, 25-30% of total food produced is lost or wasted, and companies such as Yum! Brands have been proactive in looking at opportunities to reduce food waste. Through its Harvest Program in partnership with Food Donation Connection, the company has been donating surplus food from our restaurants to food banks, soup kitchens and other nonprofits.

On the supply side, most companies are investing in sustainable production initiatives to drive the transition from existing industrial agricultural practices which are responsible for environmental degradation to a more sustainable, regenerative agricultural base. The first step towards sustainability in supply chains is to push suppliers for traceability and make certification the bare minimum for all FRCs. There cannot be sustainability without traceability. Whilst traceability is high in palm, the same cannot be said about the other commodities. Whilst commodity traceability at Nestlé is low, partnerships such as the use of Starling, a satellite-based service developed by Airbus and Earthworm Foundation to monitor the company's palm, soy, and timber supply chains could go some way to verifying its deforestation-free credentials.

Once traceability has been achieved, companies then need to engage with their supplier base to drive responsible production. The levels of ambition and

impact of these engagement programs vary dramatically from very incremental engagement processes which resemble basic supply chain audit programs to more advanced supplier engagement programs which couple engagement with the deployment of smart agri-tech or new high-yielding seed varieties. On the very transformative end of the spectrum we see companies investing in ambitious landscape style approaches which involve collaborative innovation with a range of stakeholders operating in a landscape. Leading companies are utilizing landscape approaches to deploy regenerative agriculture and soil health programs such as L'Oréal's peat replanting project in Borneo, the soil health programs rolled out by Danone, Kellogg's and General Mills and Mars' cocoa productivity project in Indonesia.

To support these sustainable consumption and sustainable production initiatives new collaborative funding mechanisms are also being deployed by leading companies to tackle deforestation. In 2015 Mars and Danone launched the Livelihoods Fund for Family Farming which commits €120 million<sup>(22)</sup> to build sustainable supply chains and generate positive social and environmental impacts for smallholder farmers, their farms and the landscapes in which they operate. Another similar initiative is the &Green Fund to which Unilever has committed an investment of 25 million US\$<sup>(23)</sup>. This fund aims to prove that financing inclusive, sustainable and deforestation-free commodity production can be commercially viable and replicable, thus strengthening the case for a rural development paradigm that protects valuable forests and peat lands and supports high-productivity agriculture.

The framework that we have used to evaluate the sustainable consumption and sustainable production innovations that companies have implemented and places an emphasis on group-wide initiatives focused on collaboration on projects that can bring about systemic changes to the agricultural landscape.

We also assess the R&D spend as well as the progress made in commodity consumption over the past year as an indication of a sign of portfolio diversification or product formulation improvement.

(22) Livelihoods Fund for Family Farming  
(23) &Green Fund

Transition opportunities have been assessed using the following five metrics;

**Metric 1) Sustainable Production Opportunities (45%):** We compiled a list of sustainable production initiatives and assigned each one with score based on the scale and impact of the initiative. The impact score was assigned based on a hierarchy of activities from low to high impact as per Fig X and the scale score was assigned depending on whether the initiative had been rolled out across a specific commodity in a specific region, a specific commodity globally or across all commodities globally. We then aggregated the scores across the top 10 best performing initiatives for each company.

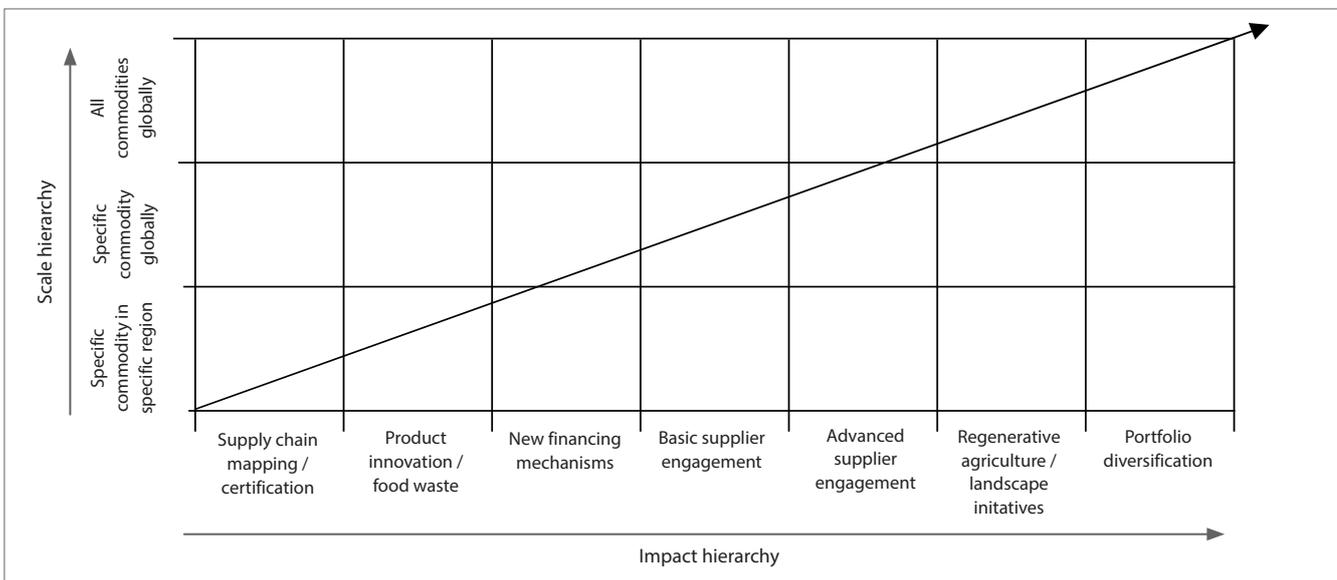
**Metric 2) Sustainable Consumption Opportunities (30%):** We applied the same methodology as described above to sustainable consumption initiatives.

**Metric 3) Brand Level Development (10%):** This metric assesses the level of diversification across a company's brand portfolio and the percentage of top 10 brands that are actively innovating to reduce deforestation risk.

**Metric 4) Progress (10%):** This metric identifies the companies that have made progress in their reducing their reliance on FRCs across financial years 2017-18.

**Metric 5) Research & Development (5%):** This metric assesses the level of research and development expenditure of the companies.

**Figure 37: Innovation matrix**



Source: CDP

## Overall highlights

- ▶ On average companies have deployed nearly 3x the amount of sustainable production initiatives as sustainable consumption initiatives.
- ▶ This focus is somewhat dependent on exposure. For companies exposed to cattle there are significant demand side opportunities associated with changing diets. For companies exposed to palm, demand side opportunities are limited due to challenges associated with substitution therefore these companies tend to focus on sustainable production.
- ▶ Almost 70% food companies were found to be investing in plant-based meat alternatives however this investment is focused around niche brands or start-ups.
- ▶ Unilever leads the group in transition opportunities scoring highest in terms of sustainable consumption and third in terms of sustainable production.
- ▶ Kraft Heinz ranks last overall in terms of transition opportunities ranking last in terms of sustainable production opportunities and third last in the brand analysis.

**Figure 38: Transition opportunities summary**

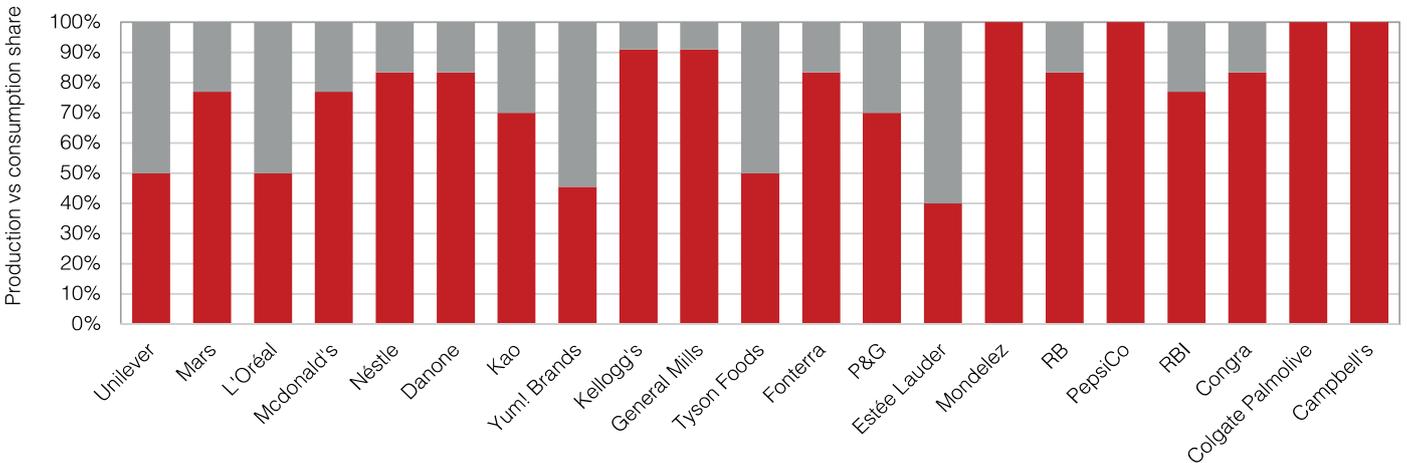
Company	Sustainable Production Opportunities	Sustainable Consumption Opportunities	Brand analysis	Progress	R&D	Overall weighted rank	Transition opportunities rank
Unilever	3	1	3	5	7	2.9	1
Mars	2	5	12	12	15	5.7	2
L'Oréal	6	4	19	3	2	6.2	3
McDonald's	4	6	2	17	21	6.8	4
Nestlé	8	11	1	9	4	7.6	5
Danone	1	16	18	19	10	9.0	6
Kao	12	8	17	2	1	9.7	7
Yum! Brands	14	3	5	4	21	9.9	8
Kellogg's	8	14	6	18	12	10.1	9
General Mills	5	17	15	21	11	11.0	10
Tyson Foods	13	3	22	9	19	11.1	11
Fonterra	9	15	4	14	17	11.4	12
P&G	16	10	16	9	3	12.5	13
Mondelez	11	21	11	9	8	13.4	14
Estée Lauder	19	8	14	6	9	13.6	15
RB	15	18	10	11	6	14.3	16
RBI	19	8	7	21	21	14.8	17
PepsiCo	10	21	21	15	14	14.9	18
Conagra	21	14	13	1	16	16.5	19
Colgate-Palmolive	19	21	8	13	5	16.7	20
Campbell's	17	21	9	16	13	16.8	21
Kraft Heinz	22	12	20	21	18	18.4	22

**Weighting**                      **45%**                      **30%**                      **10%**                      **10%**                      **5%**

Note: In calculating the weighted rank in this table, we use the weighted ranks for each area. We display non-weighted ranks in this summary for simplicity only.

Source: CDP

**Figure 39: Share of sustainable production vs sustainable consumption**



Source: CDP

■ Sustainable Production                      ■ Sustainable Consumption

## Sustainable Production Opportunities

- ▼ Danone ranks first in terms of sustainable production, investing in a number of transformative initiatives focusing on regenerative agriculture including the Soil Health Initiative through which the company has committed US\$6 million towards soil health research in collaboration with the Carbon Sequestration Centre at Ohio State University and Cornell University. Danone has also contributed to new financing mechanisms such as the Livelihoods Fund which proposes a new approach to supply chains in order to address social and environmental issues simultaneously.
- ▼ 95% of companies in the group have developed initiatives on basic supplier capacity building. Over 60% have paired these basic engagement programs with the deployment of smart agri-tech and/or new seed varieties. For example, in collaboration with IBM and the US Department of Agriculture, Mars published the preliminary version of the cacao genome, the first step in advancing farmers' ability to plant more robust, higher-yielding, and drought-and disease-resistant trees.
- ▼ Only eight companies were found to be deploying landscape style approaches focusing on regenerative agriculture and/or soil health programs.

**Figure 40: Sustainable production highlights**

Company	Description	Score	Rank
Danone	<ul style="list-style-type: none"> <li>Launched a Soil Health Initiative through which it has committed 6 million USD towards soil health research in collaboration with the Carbon Sequestration Centre at Ohio State University and Cornell University.</li> <li>Contributed to the Livelihoods Fund for Family Farming proposes a new approach to supply chains in order to address social and environmental issues simultaneously.</li> </ul>	100	1
Mars	<ul style="list-style-type: none"> <li>Supports efforts to increase yields of key crops such as cocoa through improved breeding and production techniques and through pioneering work on agroforestry.</li> <li>With partners IBM and the US Government, published the preliminary version of the cacao genome, advancing the ability to plant more robust, higher-yielding, and drought-and disease-resistant trees.</li> </ul>	85	2
Unilever	<ul style="list-style-type: none"> <li>The company is helping catalyse transformative change at the landscape or jurisdictional level in key regions of South-East Asia, South America, and West and Central Africa.</li> <li>Provided seed funding to the &amp;Green Fund which invests in commercial projects in agricultural production value chains in order to protect and restore tropical forests and peatlands and make agriculture more inclusive and sustainable.</li> </ul>	83	3
McDonald's	<ul style="list-style-type: none"> <li>Involved in the Novo Campo Program focuses on the recovery of degraded pastures and improvements in animal management, protecting the area's biodiverse ecosystems.</li> <li>Working with suppliers and research institutes to support the development of novel alternative protein feeds, to reduce our reliance on soy for chicken feed and thereby help alleviate pressure on forests.</li> </ul>	77	4
General Mills	<ul style="list-style-type: none"> <li>Developed a Regenerative Agriculture Measurement Protocol, which outlines the impact of agricultural management on soil health throughout General Mills' network of regenerative farmers and rancher.</li> <li>Quantis, White Oak Pastures and Michigan State University to conduct a life-cycle assessment of White Oak Pastures. Results demonstrated the benefit of regenerative agriculture and carbon sequestration.</li> </ul>	76	5
L'Oréal	<ul style="list-style-type: none"> <li>Developed an online platform dedicated to its strategic suppliers which gives them access to tools for sharing good practices and training.</li> <li>In high-risk profile areas in terms of deforestation, illegal production, greenhouse gas emissions, fires or impacts on water, L'Oréal proactively deploys local investigations and independent due diligences.</li> </ul>	66	6
Nestlé	<ul style="list-style-type: none"> <li>Developed improved varieties through tree breeding, soil mapping and other technologies, enabling less land to be used to grow the fiber needed.</li> <li>Earthworm Foundation and Nestlé are collaborating on seven smallholder initiatives under the Earthworm Foundation Rurality program in Indonesia, Malaysia, Ghana, Côte d'Ivoire, Ecuador, Brazil and Peru.</li> </ul>	63	7
Kellogg's	<ul style="list-style-type: none"> <li>Projects in the U.S. are advancing practices across 250,000 acres that protect soil health, including crop rotation and cover crops.</li> <li>With Syngenta, Kellogg's is providing farmers with the data they need to determine the nutrient profile of the soil, track crop performance and adopt new productivity enhancements.</li> </ul>	63	7
Fonterra	<ul style="list-style-type: none"> <li>Developed The Co-operative Difference – a straight-forward guide to help farmers understand what they need to do today and what they need to do to prepare for the future.</li> <li>Fonterra has a team of 27 Sustainable Dairying Advisors, who use their local and regional knowledge to support our farmers.</li> </ul>	57	9
PepsiCo	<ul style="list-style-type: none"> <li>PepsiCo's Sustainable Farming Program (SFP) aims to optimize economic, social and environmental on-farm practices and outcomes.</li> <li>PepsiCo partners with farmers to pass on the skills and information needed to boost productivity and comply with sustainable farming principles.</li> </ul>	49	10
Mondelez	<ul style="list-style-type: none"> <li>The company's Cocoa Life program addresses social and environmental challenges on the ground, working hand-in-hand with the men and women who make their living from cocoa.</li> <li>The company's Harmony wheat program in Europe, promotes biodiversity and good environmental practices in wheat production.</li> </ul>	46	11
Kao	<ul style="list-style-type: none"> <li>Kao engages in environment conservation activity in Thailand where rapid deforestation is becoming a social problem.</li> <li>Collaborating with on the ground NGOs to establish traceability to palm oil smallholders.</li> </ul>	33	12
Tyson Foods	<ul style="list-style-type: none"> <li>Working with Environmental Defense Fund, Tyson will scale up the use of cloud-based agricultural technologies from MyFarms and Farmers Business Network (FBN). Both systems collect information on agricultural production practices.</li> <li>The company is also deploying blockchain technology to enhance traceability.</li> </ul>	27	13
Yum! Brands	<ul style="list-style-type: none"> <li>In collaboration with suppliers, Yum! Brands are invested in implementing and maintaining sustainable, integrated livestock production systems.</li> <li>The company minimizes risk throughout the supply chain by requiring that suppliers follow their Supplier Code of Conduct and by engaging in periodic risk assessments and audits.</li> </ul>	30	14
RB	<ul style="list-style-type: none"> <li>RB invests in continued support for smallholder palm oil farmers through "Rurality" programmes, focused on improving agricultural practices and reducing pressure on natural forests.</li> <li>Piloting the 'Starling Programme', a partnership between Airbus and TFT, which utilises radar and satellite imagery to analyse land use in palm oil growing regions.</li> </ul>	25	15
P&G	<ul style="list-style-type: none"> <li>Partnering with International Plant Nutrition Institute (IPNI) in a multi-year agreement to develop up to 75 core innovator farms and 165 primary innovator farms to demonstrate best practice.</li> </ul>	26	16
Campbell's	<ul style="list-style-type: none"> <li>The Campbell Soup Company Fund for Research in Sustainable Agriculture in Vegetables funds education and public outreach about natural pest management, soil health, crop rotation and water management.</li> </ul>	24	17
Estée Lauder	<ul style="list-style-type: none"> <li>Partnering with BASF, Solidaridad and RSPO on a three-year project to support Indonesian famers by offering education and technical support on implementing sustainable palm oil practises.</li> </ul>	23	18
RBI	<ul style="list-style-type: none"> <li>The Tim Hortons brand has been involved in a number of sustainable coffee collaborations and public-private partnerships.</li> </ul>	23	18
Colgate-Palmolive	<ul style="list-style-type: none"> <li>Working with the Earthworm Foundation (EF) and The Forest Trust to support on the ground projects in Indonesia focused on addressing social and environmental issues in the palm oil supply chain.</li> </ul>	23	18
Conagra	<ul style="list-style-type: none"> <li>Launched a new Supplier Excellence Program, which provides enagement with top direct material suppliers, which includes 60 suppliers, representing approximately 75 percent of our overall spend on food ingredients.</li> </ul>	22	21
Kraft Heinz	<ul style="list-style-type: none"> <li>Developed advanced supplier engagement programs for their tomato farmers, including new seed varieties in specific regions.</li> </ul>	15	22

## Driving transformative change at the landscape level

The FAO defines a sustainable food system as one that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised<sup>(2)</sup>. In order to achieve this, environmental protection and human nutrition and livelihoods, which currently exist as competing priorities in today's food system, must be married such that one cannot be achieved without the others. Transitioning to a sustainable food system therefore requires a clear understanding of the synergies and trade-offs between different priorities. For example, agricultural expansion and intensification threatens environmental goods and services which in turn could undermine efforts to meet future food demands while also affecting livelihoods and health<sup>(24)</sup>.

Landscape approaches have gained prominence in the search for solutions that reconcile conservation and development trade-offs. These address the limitations of many traditional approaches which often focus on improving practices within single farms or commodities<sup>(25)</sup>. Traditional sustainable food programs also tend to adopt a production-focused approach, which seeks to directly influence food security through increasing the supply of food. The focus on food production leads to the neglect of other areas in which the root causes of the food system underperformance, as well as the leverage points to bring about the biggest impacts can often be found<sup>(2)</sup>.

By contrast, landscape approaches take a more holistic, coordinated approach and involve building coalitions that bring together key stakeholders in a landscape, including governments, businesses, farmers, communities, and civil society organizations. According to IDH, landscape approaches must create areas where commercial and food crops are grown sustainably; forests and other natural resources are sustainably used and protected; and farmers' and communities' livelihoods are enhanced<sup>(25)</sup>. The proliferation of landscape approaches in recent years has begun to yield positive results both from an environmental and development perspective. Some successful case studies include the Mau Forest Complex in western Kenya and the Verified Sourcing Area in Aceh, Indonesia.

**Figure 41: IDH Landscape Framework**



Source: IDH Sustainable Trade Initiative

### Mau Forest Complex, Kenya<sup>(25)</sup>

More than a quarter of the Mau forest in Kenya has either been deforested or degraded in recent decades, driven by growing populations, unsustainable livestock grazing, charcoal burning and timber extraction from the forest. This land degradation has put tea production, other sectors and community livelihoods which rely on the Mau forest for environmental products and services at risk. In response, a coalition was built between Nakuru, Kericho and Bomet county governments, national government agencies, tea, energy, telecommunications and timber companies and civil society to develop solutions to protect the South West Mau forest. The coalition developed an integrated action plan based on forest conservation, improvement of water flow and access to water, sustainable energy, and alternative livelihoods for communities. Coalition members have already translated this plan into action, with concrete projects in terms of forest restoration, water flow improvement and alternative livelihoods.

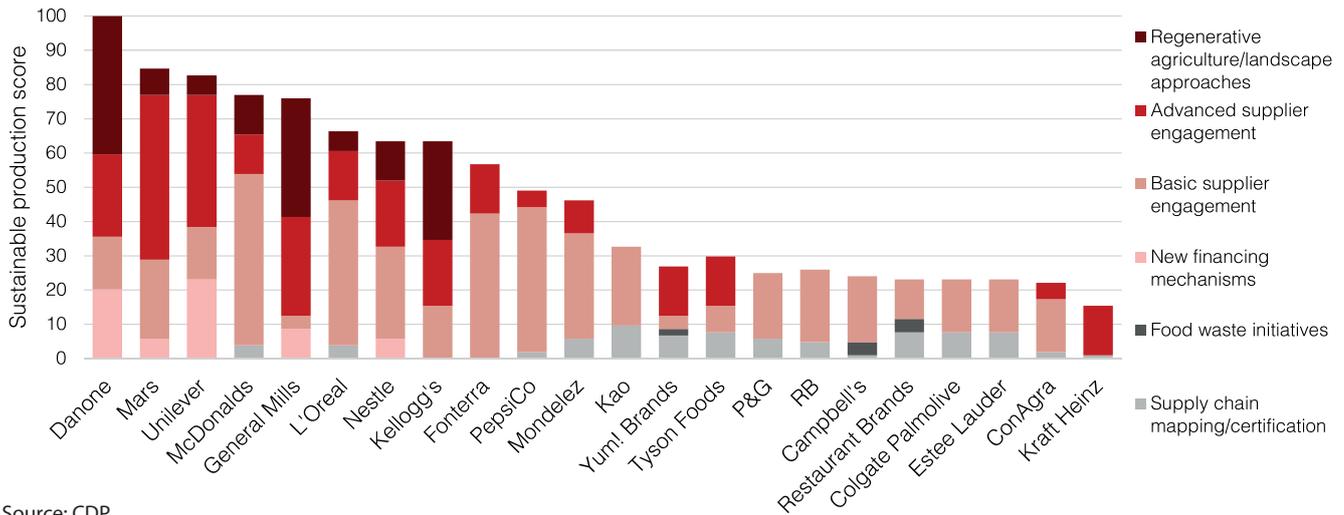
### Verified Sourcing Area, Aceh, Indonesia<sup>(25)</sup>

The Leuser ecosystem in the province of Aceh is one of the most biodiverse locations on Earth. Aceh is also increasingly becoming important for the production of a number of tropical commodities including palm oil, rubber, coffee and cocoa. While this is critical in supporting economic development, the increase in agricultural production has negatively impacted the health of the forest. In response, provincial and district governments worked together to develop a provincial green growth plan, combining forest protection with opportunities for sustainable commodity development for smallholders. The plan is now being integrated into government planning and is already taking effect. In addition, public, private and civil society stakeholders have been working towards setting up a Verified Sourcing Area in Ahem Tamiang which includes signing a jurisdictional compact which will define targets on forest and peat protection, good governance, labor, land tenure and transparency.

(24) Sayer, J. et al: Ten principles for a landscape approach to reconciling agriculture, conservation and other competing land uses

(25) IDH Sustainable Trade Initiative: IDH's approach to sustainable landscapes

**Figure 42: Sustainable production opportunities score**



Source: CDP

## Sustainable Consumption Opportunities

- Our analysis shows a much higher rate of investment in sustainable production activities than sustainable consumption activities. Four companies, Mondelez, Campbell's, PepsiCo and Colgate-Palmolive, have not demonstrated any sign of investment in sustainable consumption.
- With the exception of Unilever, activity is highest amongst traditional meat players such as Tyson Foods and Yum! Brands. Almost 70% of food companies have invested in plant-based meat alternatives. Nearly 50% have developed in-house capacity in already existing or new brands while 20% have invested in external start-ups such as Beyond Meat.
- Unilever leads the group in terms of sustainable consumption. The company recently brought the Vegetarian Butcher brand into its portfolio and has innovated product ranges within a number of its personal care brands to be vegan.
- Tyson Foods and Yum! Brands rank tied second with both companies having not only invested in meat-free alternatives but also having deployed numerous innovations relating to food waste.

**Figure 43: Sustainable consumption highlights**

Company	Description	Score	Rank
Unilever	<ul style="list-style-type: none"> <li>Recently bought The Vegetarian Butcher a plant-based meat brand</li> <li>A number of Unilever's personal care brands have developed vegan ranges</li> </ul>	100	1
Tyson Foods	<ul style="list-style-type: none"> <li>Co-led a seed investment round for Future Meat Technologies</li> <li>Partnered with FlashFood to collaborate on food waste initiatives utilizing surplus food</li> </ul>	94	2
Yum! Brands	<ul style="list-style-type: none"> <li>Through their Harvest Program Yum! Brands have been donating food waste to food banks and soup kitchens</li> <li>The KFC brand launched plant based chicken alternatives</li> </ul>	94	2
L'Oréal	<ul style="list-style-type: none"> <li>Developed vegan product ranges across a number of cosmetic brands</li> </ul>	56	4
Mars	<ul style="list-style-type: none"> <li>Developed vegan mars bars and ice cream ranges</li> <li>Innovating products to reduce burden on natural resources</li> </ul>	44	5
McDonald's	<ul style="list-style-type: none"> <li>Launched a meat-free burger</li> <li>Ran consumer engagement campaigns on sustainable coffee and recycling</li> </ul>	39	6
Estée Lauder	<ul style="list-style-type: none"> <li>Developed vegan product ranges across a number of cosmetic brands</li> </ul>	33	7
Kao	<ul style="list-style-type: none"> <li>Innovating products to reduce burden on natural resources</li> </ul>	33	7
RBI	<ul style="list-style-type: none"> <li>Burger King brand launched plant based meat burger products</li> </ul>	33	7
P&G	<ul style="list-style-type: none"> <li>Working to innovate Forest Positive products</li> <li>Reducing paper requirements and increasing absorption of Puffs and Bounty products</li> </ul>	28	10
Nestlé	<ul style="list-style-type: none"> <li>Developed a plant-based burger within the Sweet Earth brand</li> <li>Developed vegan ice cream product ranges</li> </ul>	22	11
Kraft Heinz	<ul style="list-style-type: none"> <li>The BOCA foodservice brand developed a range of plant-based meat products</li> <li>Launched the Springboard platform to accelerate the growth of disruptive brands</li> </ul>	19	12
Kellogg's	<ul style="list-style-type: none"> <li>Launched a new Incogmeato line of plant-based meat products</li> </ul>	17	13
Conagra	<ul style="list-style-type: none"> <li>The Gardein brand developed plant-based meat products</li> </ul>	17	13
Fonterra	<ul style="list-style-type: none"> <li>Invested in Motif Ingredients which develops bio-engineered food ingredients</li> <li>Launched a number of food waste initiatives</li> </ul>	14	15
Danone	<ul style="list-style-type: none"> <li>Developed a number of plant-based products within traditional dairy brands</li> </ul>	11	16
General Mills	<ul style="list-style-type: none"> <li>Invested in a number of start up plant-based/vegan brands</li> </ul>	8	17
RB	<ul style="list-style-type: none"> <li>Developed vegan baby formulas in baby nutrition brands</li> </ul>	6	18

Source: CDP

# Plant based proteins: the next generation of meat

## The rise and fall of the traditional meat industry

The proliferation of environmentally conscious consumers is stimulating demand for sustainably produced food. Society is becoming increasingly aware of the environmental challenges associated with the meat industry, while concerns over animal welfare and health impacts associated with eating meat are accelerating the shift towards reduced and meat-free diets.

In a divergence from traditional meat substitutes once marketed at vegetarians and vegans, a new wave of “alternative meat” products have entered the mainstream market in recent years. The key difference? With the principal aim to replicate the taste and texture of meat, the target market is meat-eaters. Two main types of alternative meat products are being developed by innovative companies:

- Plant-based meat: products made from plant-derived ingredients
- Cell-based or cultured meat: products made from animal cells cultured in a laboratory

Meat substitutes have experienced widespread uptake in recent years, with the global market growing to US\$4.6 billion in 2018 and a CAGR of 6.8% expected in the period to 2023<sup>(26)</sup>. Plant-based meat company Beyond Meat’s successful 2019 IPO is further evidence of the industry’s potential; its stock rose 160% above its US\$25 IPO price in its first session<sup>(27)</sup>. Production of cultured meat is currently at a small scale and products are not yet available on the market. However, industry experts expect that the technology to scale-up production could be ready as early as 2021<sup>(28)</sup>.

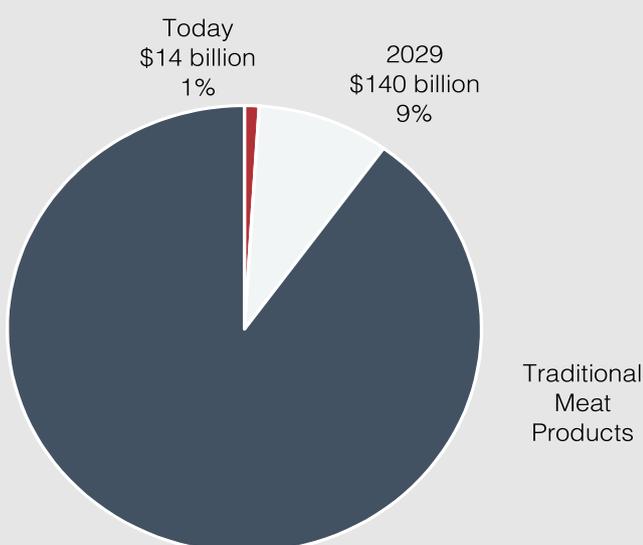
Plant-based and cultured meat alternatives are significantly less emissions- and land-intensive than traditional meat products. Growing demand for more sustainable meat alternatives therefore poses a disruptive threat to the traditional meat industry’s until now uninterrupted growth trend. Food retailers have already begun to capitalise on new opportunities. Burger King’s partnership with Impossible Foods saw the ‘Impossible Whopper’ go nationwide in the US in August 2019<sup>(29)</sup>, and in the same month Yum! Brands began trialling Beyond Meat’s plant-based chicken nuggets at a KFC in Atlanta<sup>(30)</sup>. Consumer goods companies are also buying in. In 2018 Tyson Foods invested in Memphis Meats<sup>(31)</sup>, a company developing cell-based meat, while Nestlé introduced new plant-based burgers in Europe and the United States in 2019.

## The future looks bright for alternative meat

Europe and North America currently dominate research and investment in alternative meat, with Europe accounting for the largest market share of meat substitute products in 2017 (39%)<sup>(32)</sup>. However, despite growing meat consumption in Asia, many Asian countries’ traditional diets have long been based on plant-based proteins, and the Asia-Pacific region is estimated to be the fastest growing market for alternative meats in the next five years<sup>(26)</sup>.

Long-term growth estimates for the alternative meat market vary. Barclays estimates foresee the alternative meat market reaching US\$140 billion by 2029<sup>(33)</sup>. Meanwhile, global management consulting firm AT Kearney estimates that cultured meat will account for 10% of the multi-billion-dollar global meat market by 2030, and plant-based meat 18%<sup>(28)</sup>.

Figure 44: Alternative meat's slice of the global meat industry



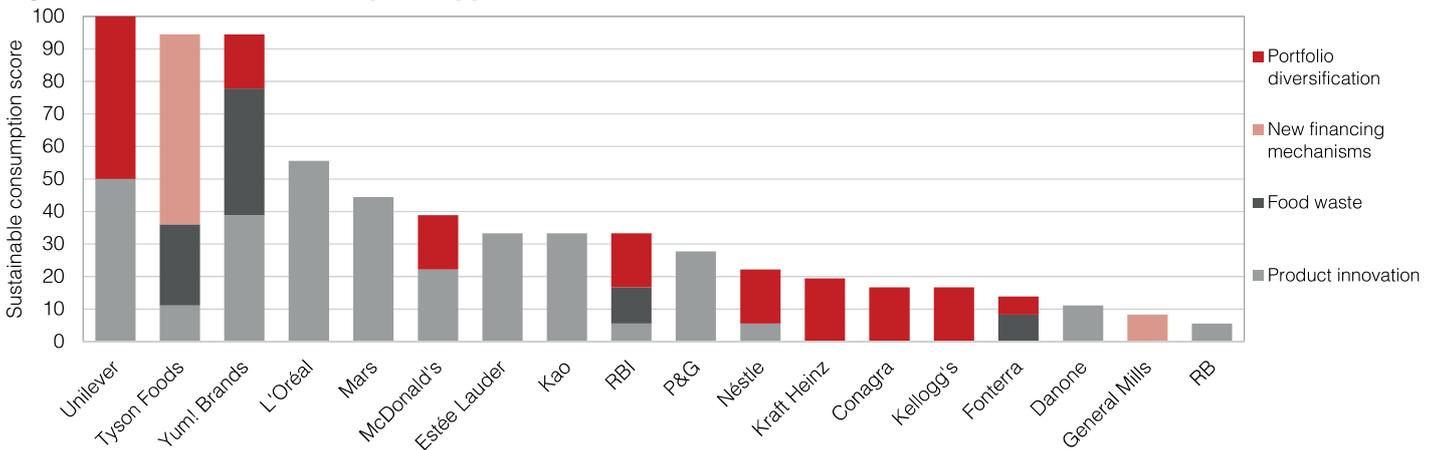
Source: CDP, Barclay's Research

Several obstacles continue to hinder growth of the alternative meat industry – principally scalability and price. The majority of alternative meat products are not yet cost-competitive with meat. However, prices will fall as production is scaled up and more players enter the market, encouraging competition and lowering production costs via increased research and technological advances. Public policy support, an injection of capital investment, and effective promotion and marketing will also be crucial to the industry’s success.

Despite existing challenges, the pace of the alternative meat industry’s growth to date demonstrates the disruptive force facing the global meat industry. Alternative meat’s rapid uptake signals the potential for significant growth and investment opportunities amid the continuing shift in consumer preferences towards sustainably produced food.

(26) Research and Markets: Meat substitutes market by types  
(27) CNBC: Alternative meat to become \$140 billion industry in a decade  
(28) A.T. Kearney: How will cultured meat and meat alternatives disrupt the agricultural and food industry  
(29) Bloomberg: The hottest thing in food is made of peas, soy and mung beans  
(30) Reuters: KFC partners with Beyond Meat to test plant based nuggets and wings  
(31) Tyson Foods: Tyson Foods invests in cultured meat with stake in Memphis Meats  
(32) Mordor Intelligence: Meat substitutes market - growth, trends and forecast (2019-24)  
(33) Barclays: Carving up the alternative meat market

**Figure 45: Sustainable consumption opportunities score**



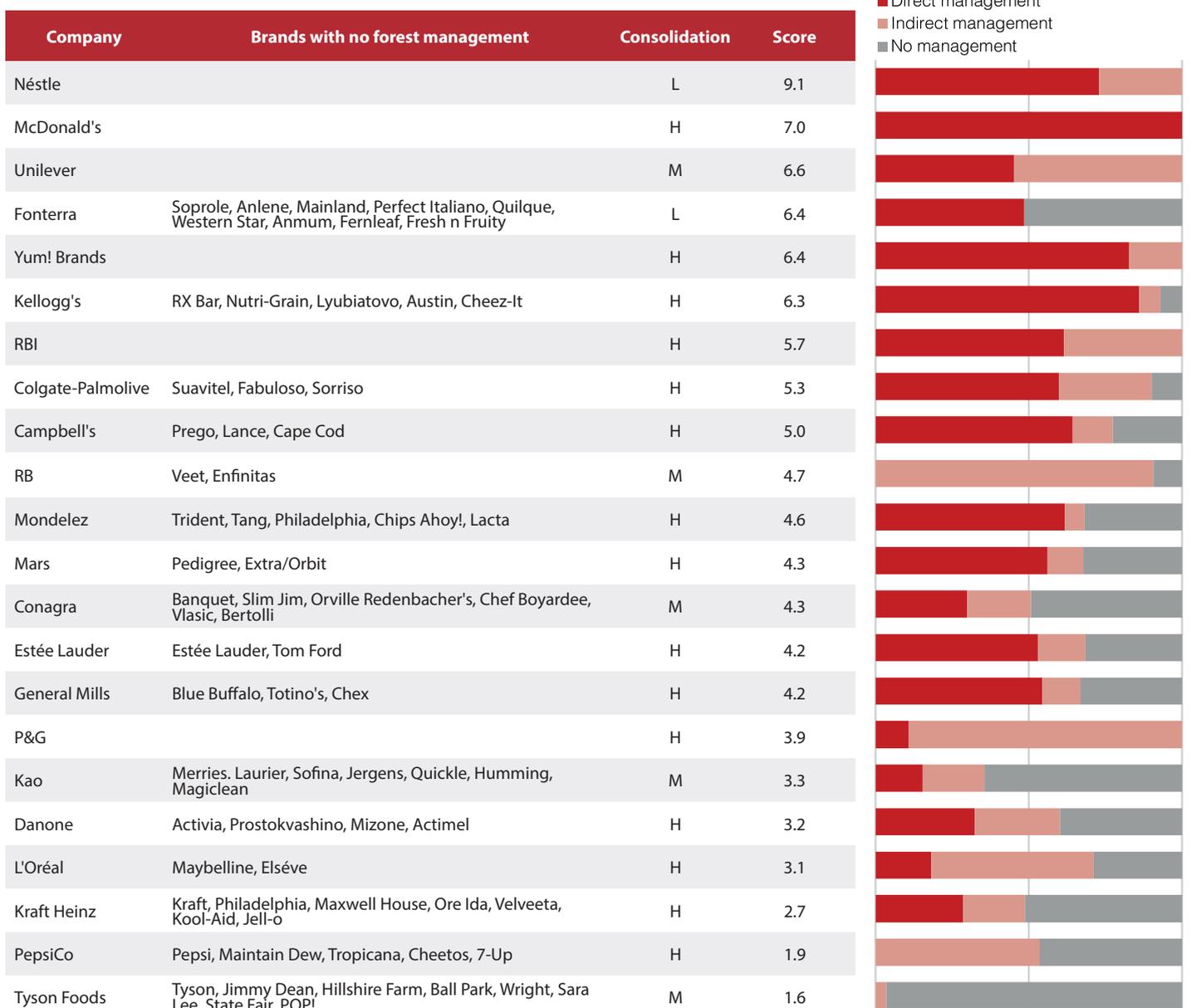
Source: CDP

## Brand analysis

▼ Nestlé comes top as it has a diversified portfolio and over 70% of its top 10 brand revenues with direct management of forestry issues. None of its brands fail to manage forest-related risks directly or indirectly.

▼ Tyson ranks last with over 90% of top 10 brand revenues failing to manage forest-related risks.

**Figure 46: Brand analysis summary**



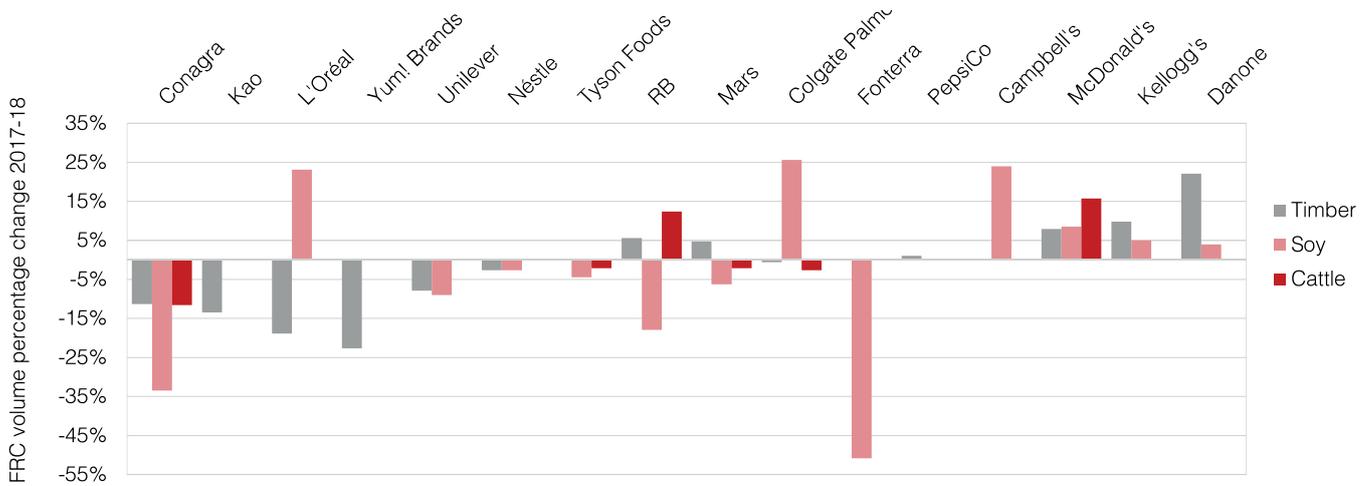
Source: CDP, Euromonitor

## Progress

This metric measures whether companies have successfully reduced their reliance on FRC through volume reductions across the financial years 2017-18. We have consciously excluded palm oil from this analysis as we know that the substitution of palm oil for other vegetable oils could cause environmental issues elsewhere e.g. substitutes such as sunflower oil have higher land use intensity. For the remaining FRCs; timber, cattle and soy, we look at this metric as an indication that companies are potentially changing their formulations, packaging designs or shifting their portfolios towards one with lower FRC intensity.

- ▼ Conagra ranks first having reduced in volume consumption across all three commodities. It has achieved an almost 35% reduction in the volume of soy used across the period.
- ▼ Of those companies which disclose volume data. Danone ranks last having increased in reliance on both timber and soy across the period.
- ▼ RBI, Mondelez, Estée Lauder, General Mills, P&G and Kraft Heinz have failed to disclose volume data for the years 2017 and 2018.

**Figure 47: Progress by commodity 2017-18**

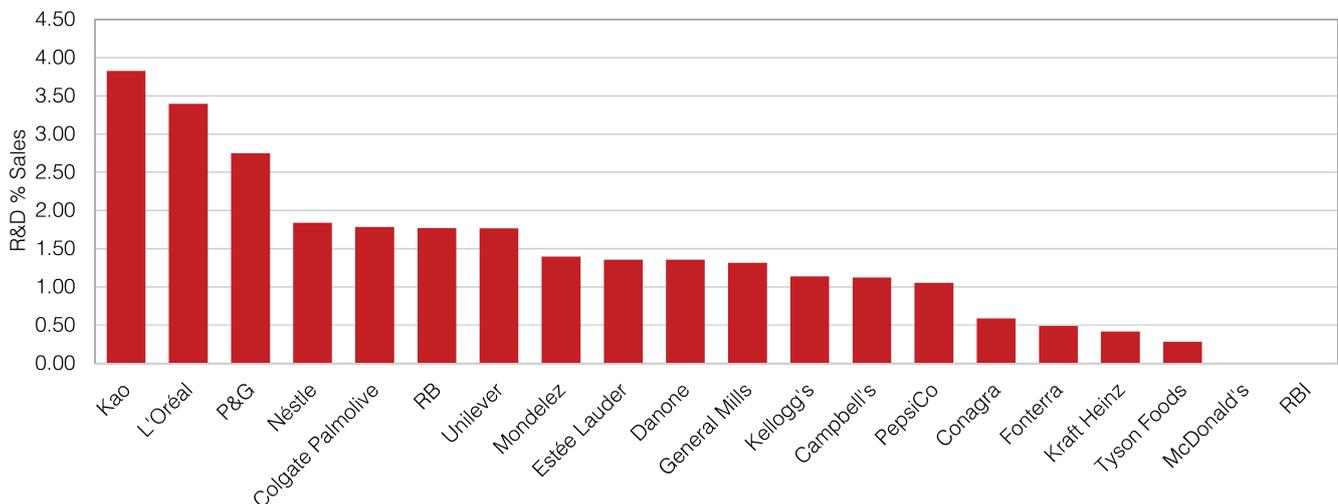


Source: CDP

## R&D expenditure

- ▼ Generally speaking personal care companies tend to invest more in R&D than food companies. Traditionally chemistry has played a greater role in the development of personal care formulations compared with new food products however this is changing.
- ▼ Kao and L'Oréal rank first and second respectively, both investing more than 3% of sales into R&D.
- ▼ Two of the three food retailers McDonald's and RBI rank joint last with less than 1% of R&D invested in sales.
- ▼ Mars and Yum! Brands do not disclose R&D expenditure.

**Figure 48: R&D as a percentage of sales**



Source: CDP

# Deforestation governance & strategy

- ▼ Just five out of 22 companies have zero-deforestation commitments that cover the entirety of their supply chains.
- ▼ An additional five have zero-net deforestation commitments which are in line with the Consumer Goods Forum's resolution however failure to meet this casts doubt on the feasibility of commitments.
- ▼ 60% of companies have made commitments on smallholder inclusion.
- ▼ European companies Danone, Unilever, Nestlé and RB have credible board members with significant experience in sustainable agriculture practice.

## Overview

Shifts in consumer preferences, increasing physical risks to supply chains and intensifying regulatory pressure have made consumer companies ripe for disruption. Companies with strong governance structures and corporate strategies will be best positioned to capitalize on the shift to zero deforestation supply chains and management efforts must be directed towards building resilience across the entire value chain.

The public-facing nature of these companies and the growing demand for transparency means that zero deforestation strategies and targets are increasingly under scrutiny. Conversely, these strategies offer a platform to directly communicate with consumers and can be used as marketing opportunities for businesses. Strong strategies are those that look across the entire chain from farm to consumer and are integrated into all aspects of business activities from governance to policy engagement.

The presence of board members with sustainability expertise and active risk management processes for all FRC exposures provide insight into a company's readiness and commitment towards a transition to sustainable supply chains, free from deforestation. Many companies have set traceability and certification targets as a tool to quantify progress on sustainability, but the issue runs much wider and companies need to be collaborating with actors at all points of the value chain to bring about systemic changes in global agricultural practices; governments, jurisdictions, competitors and smallholders all need to get involved.

We evaluate the strength of company governance and strategy in this section based on the following metrics:

**Metric 1) Deforestation Strategy (40%):** We evaluate a company's commitment to zero-deforestation through assessing the presence of commodity specific policies, implementation and reporting processes for FRC exposures.

**Metric 2) Board level management (25%):** Companies are assessed on a number of factors relating to board and executive deforestation responsibility performance including the level of directors on the board with sustainable procurement related experience, the presence of deforestation-related committees (at board and/or executive levels) and the overall quality of climate-risk management systems.

**Metric 4) Risk management processes (15%):** We evaluate the risk management processes in place to manage the risks associated with deforestation. We consider frequency of risk assessments, risk assessment horizons and risk assessment methodologies.

**Metric 3) Company-wide Commitments (10%):** This metric aims to evaluate a company's public commitment to deforestation. Companies are assessed on the strength of their deforestation commitments.

**Metric 5) CDP Forest Ranking (10%):** The companies were assessed according to average CDP Forests 2018 score.

## Overall highlights

- Five out of 22 companies have zero deforestation commitments, an additional five have zero-net deforestation commitments which although weaker, are in line with CGF's resolution. The remaining 12 companies have no deforestation commitments or merely commodity specific deforestation commitments.
- European companies Danone, Unilever, Nestlé and RB have credible board members with significant experience in sustainable agriculture practice.
- Only 20% of companies have commitments that cover all their FRCs. Just 20% of companies with cattle exposure and 40% of companies with soy exposure have commodity-specific commitments covering the procurement of these FRCs.
- Growing gap between companies' ambition and targets indicates that they will not meet the Consumer Goods Forum resolution to achieve zero net deforestation by 2020.
- 30% of targets for palm oil are more than 30% short of delivery. Most of these goals relate to certification and traceability of palm oil to plantation of origin.
- Disparity between the treatment of different FRCs also indicates that companies are falling short of zero deforestation commitments. Whilst 90% of companies have set timebound certification and traceability targets for palm oil, less than 50% of companies have set any targets for soy or cattle.
- Current certification and traceability systems are not effectively addressing the issue of deforestation in supply chains. Certified volumes account for just 20% of global palm oil production, 10% of forestry products and less than 5% of soy.
- Given the low coverage of certified volumes of FRCs, companies need to be adopting sourcing policies on the basis of sustainability principals as well. 60% of companies have commitments relating to the inclusion of smallholders in their supply chains.

Figure 49: Deforestation governance & strategy summary

Company	Deforestation Strategy	Board & executive management	Risk Management Rank	Commitment scorecard	Average CDP Score (2019)	Overall weighted rank	Transition risks rank
Unilever	2	2	9	7	5	4.00	1
Kellogg's	5	5	3	1	7	4.75	2
Nestlé	3	1	10	1	20	5.30	3
Kao	1	16	5	1	1	5.60	4
Danone	6	3	17	1	1	6.15	5
L'Oréal	8	10	7	1	1	7.20	6
PepsiCo	7	7	14	11	1	7.85	7
Mars	3	19	4	7	9	8.30	8
McDonald's	12	4	2	1	19	8.35	9
General Mills	9	9	18	7	6	10.00	10
Colgate-Palmolive	13	8	6	7	14	10.35	11
RB	15	6	1	14	15	10.60	12
P&G	10	14	10	12	20	12.25	13
Mondelez	11	11	10	16	20	12.25	14
Conagra	16	13	13	21	8	14.50	15
Fonterra	14	17	14	18	11	14.95	16
Campbell's	17	12	20	12	16	15.65	17
Yum! Brands	19	19	16	17	9	17.35	18
Estée Lauder	18	18	19	18	11	17.55	19
RBI	21	22	8	14	11	17.65	20
Tyson Foods	22	15	21	22	17	19.60	21
Kraft Heinz	20	21	22	18	18	20.25	22
<b>Weighting</b>	<b>40%</b>	<b>25%</b>	<b>15%</b>	<b>10%</b>	<b>10%</b>		

Note: In calculating the weighted rank in this table, we use the weighted ranks for each area. We display non-weighted ranks in this summary for simplicity only.

Source: CDP

## Deforestation strategy

Whilst some companies are still assessing deforestation factors in isolation to the corporate planning process, others have fully integrated their deforestation and corporate strategy mechanisms and are leveraging this integrated approach as a key market differentiator for their brands. We assess strategic planning associated with the transition zero net deforestation supply chains using CDP disclosure and public reporting. More specifically, we look at:

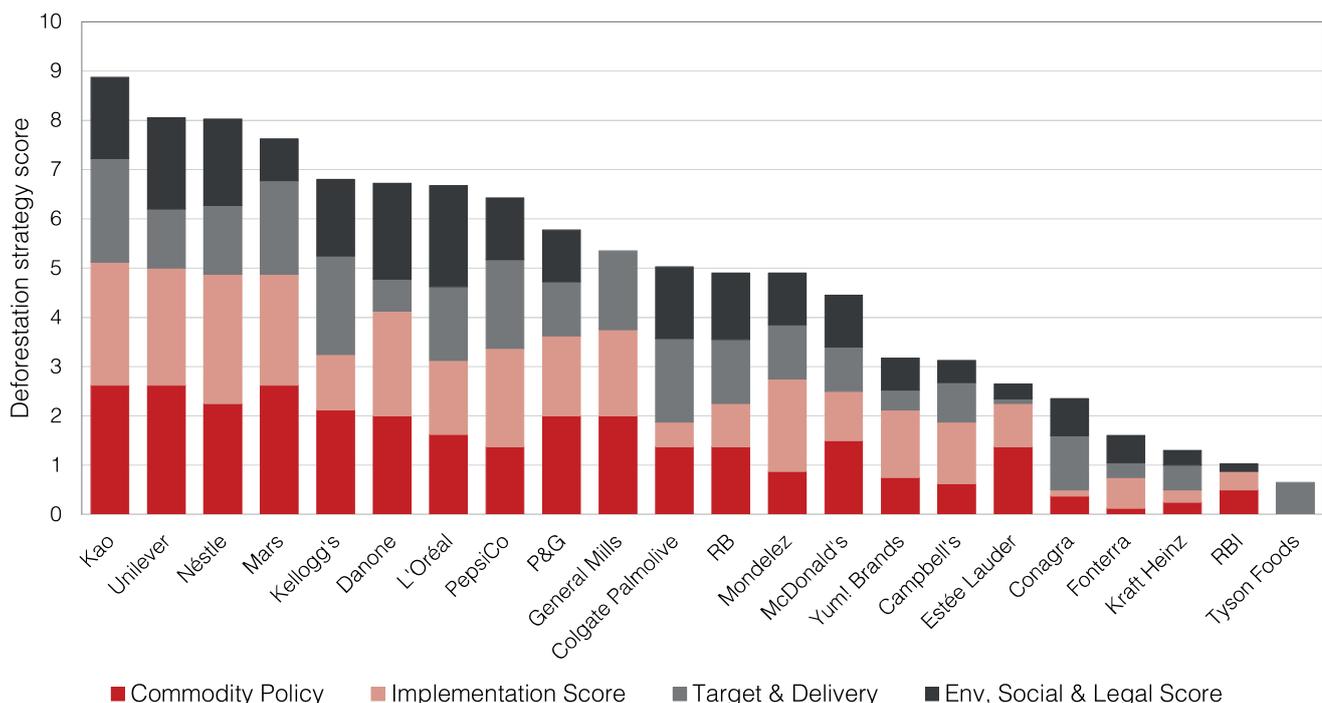
**Metric 1) Policy and implementation Score (60%):** This metric analyses the presence and quality of commodity-specific commitments and implementation strategy for a company's FRC exposures.

**Metric 2) Targets and Delivery (20%):** This metric analyses the strength of a company's targets and current variance from targets. We evaluate a company's targets based on the following framework.

**Metric 3) Social score (20%):** This metric evaluates a company's social commitments; includes human rights, workers' rights and smallholder inclusion.

- ▼ Kao scores well on Deforestation Strategy. The company has exposure to only Timber and Palm oil and has commodity-specific policies for both FRCs. The company has achieved its initial targets of traceability for timber and palm oil supply. It now targets 100% traceability to plantation for palm oil.
- ▼ Tyson Foods scores badly on deforestation strategy. Although the company has met its target, one was only set for cattle procurement. The company has no commodity specific commitments on palm oil or soy.
- ▼ Only four of the 22 companies have commodity policies covering the scope of their FRC exposure, Mars, Danone, Kellogg's and Kao.
- ▼ Growing gap between companies' ambition and targets indicates that they will not meet the Consumer Goods Forum resolution to achieve zero net deforestation by 2020. 30% of targets for palm oil are more than 30% short of delivery. Most of these goals relate to certification and traceability of palm oil to plantation of origin.
- ▼ Disparity between the treatment of different FRCs also indicates that companies are falling short of zero deforestation commitments. 90% of companies have set timebound certification and traceability targets for palm oil yet less than 50% of companies have set any targets for soy or cattle.
- ▼ Given the low coverage of certified volumes of FRCs, companies need to be adopting sourcing policies on the basis of sustainability principals as well. 60% of companies have commitments relating to the inclusion of smallholders in their supply chains.

Figure 50: Deforestation strategy score



Source: CDP, company reporting, Forest 500

## Board and executive level management

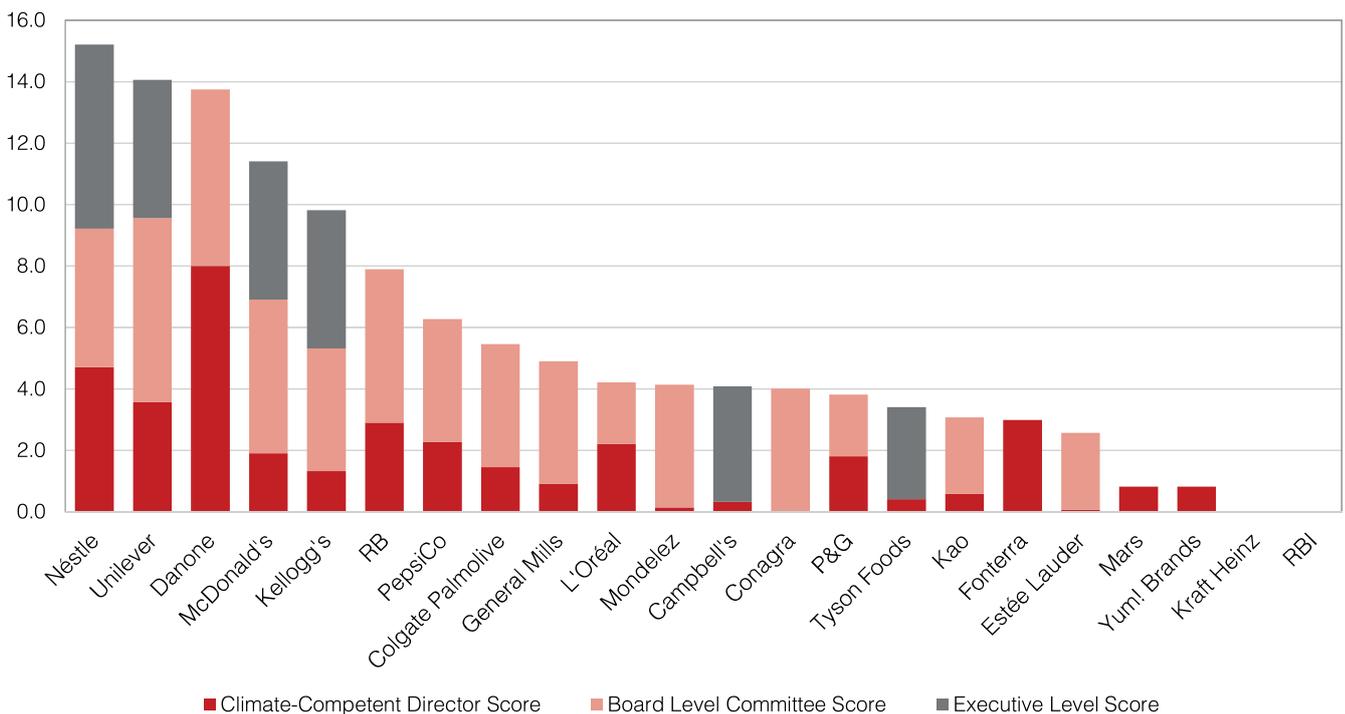
**Metric 1) Sustainable procurement-competent director score (40%):** This metric analyses the quality of the board members and ranks each company according to the experience that the board members have in sustainability. Boards that consist of a higher proportion of members with material sustainability experience score better than companies consisting of board members with weak experience in sustainability issues.

**Metric 2) Board committee score (30%):** This metric looks at the quality of the board-level committees and the quality of disclosure. Companies with independent boards and chairs score better, as do companies with boards that have a clear deforestation risk focus.

**Metric 3) Executive committee score (30%):** This metric looks for the presence of an executive-level deforestation-risk committee with a clear deforestation risk focus. Companies with a dedicated committee rank better.

- ▼ Nestlé leads in the area of board level management, performing well on all three metrics. 10 of its 12 board members have previous sustainability experience. Director Ann Veneman was previously US Department of Agriculture secretary from 2001-2005 and UNICEF Executive Director from 2005-2010. Nestlé also scores well due to the presence of both a board-level sustainability committee and an executive-level sustainability committee.
- ▼ RBL ranks poorly overall; of its 12 board members, just one has sustainability experience. Three of the 12 board members are also board members of Kraft Heinz, which also ranks poorly in this metric.
- ▼ Neither Yum! Brands nor RBL have a board-level sustainability committee or an executive-level sustainability committee. McDonald's has both.

**Figure 51: Board & executive climate management**

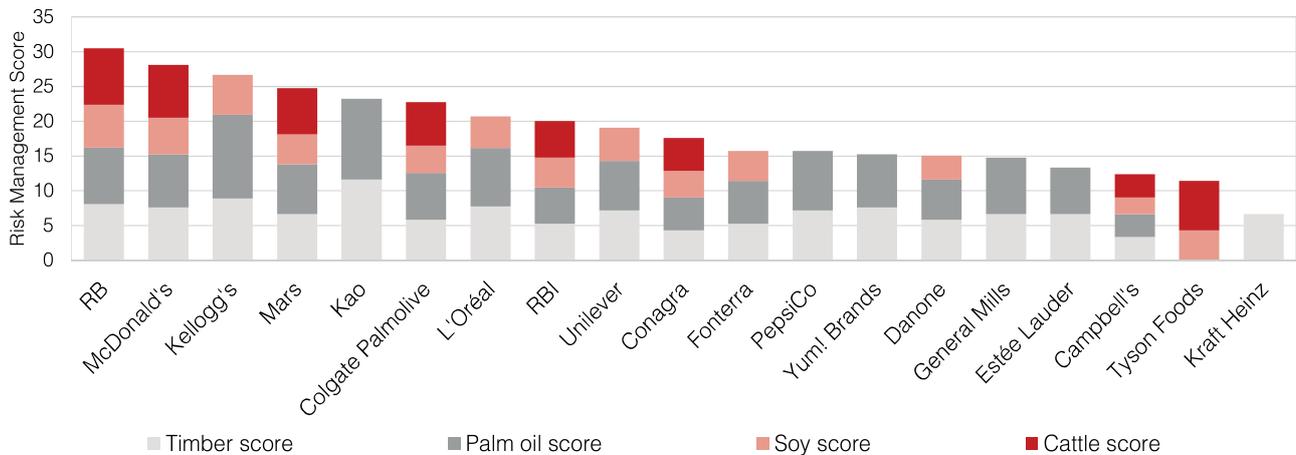


Source: CDP

## Risk management scorecard

- Only 26% of companies assess palm oil as a standalone issue, the number is much lower with soy and cattle, where just two companies assess the commodities as a standalone issue.
- 42% of companies have risk management processes in place for all exposed commodities.
- McDonald's and RB score well, scores well, assessing risks on a six-monthly basis across its supply chain. The company uses a combination of internal methods, external consultants and other specific tools to manage and assess its risks.
- RB ranks first on our Risk Management Scorecard where FRCs are assessed annually as a stand-alone issue. Risk assessments cover the full value chain, using both internal and external inputs.
- Kraft Heinz ranks last in our Risk Management Score. Management of palm oil risks was inadequate with assessments carried out bi-annually. Tyson also performs weakly comes out bottom for this reason.

Figure 52: Risk management scorecard

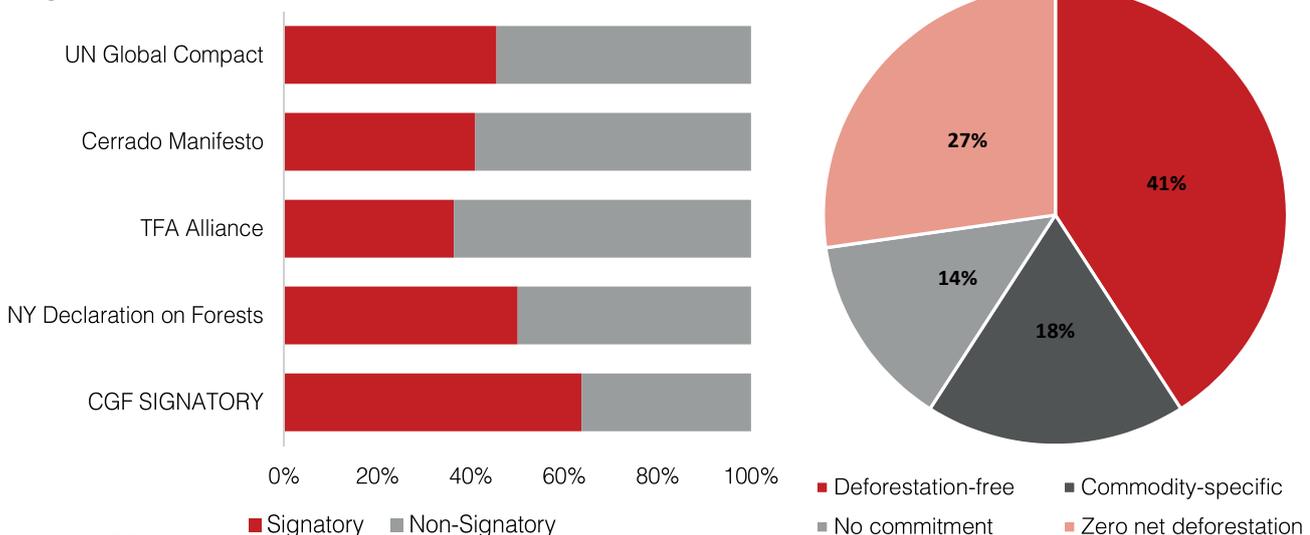


Source: CDP

## Commitment scorecard

- 40% have zero deforestation commitments, 27% zero net deforestation commitments and 18% commodity-specific deforestation commitments. Tyson Foods, Yum! Brands and Conagra do not have any deforestation commitments.
- Zero deforestation and zero net deforestation are terms often used interchangeably but differ drastically. The former dictates that no forest areas are cleared or converted, whilst the latter allows for the clearance or conversion of forests in an area provided an equal area is planted elsewhere. The Consumer Goods Forum commits signatories to "Zero Net Deforestation" in their supply chain.
- Six of the 22 companies are not signatories to the Consumer Good Forum, and within them are all three of the Fast Food Retailers. McDonald's and Yum! Brands have signed up to the New York Declaration on Forests.

Figure 53: Commitment scorecard



Source: CDP

## Engaging with producers to tackle deforestation

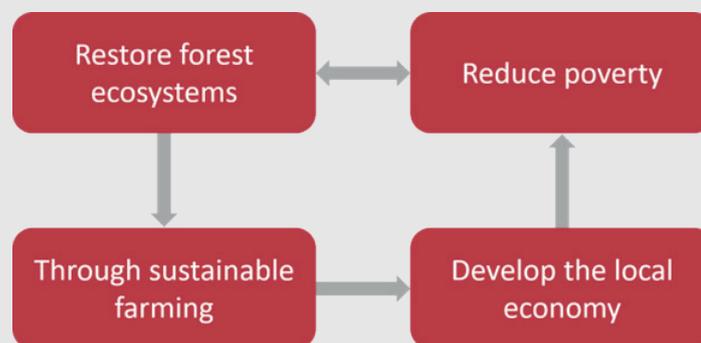
Farmers are the foundation of agricultural and forestry supply chains, producing the crops, livestock and timber that companies rely on to make their products and packaging. They are often also directly involved in causing the deforestation that makes these commodities a 'forest risk'. In order to achieve zero deforestation commitments companies must therefore engage producers to halt deforestation, restore degraded forests and transition towards more sustainable agricultural and forestry systems.

Palm oil, cattle, soy and timber all have different producer bases. 40% of palm oil is produced by smallholder farmers<sup>(34)</sup> and smallholders are the largest producers of cattle products in many countries<sup>(35)</sup>. In the US, Brazil and Argentina where over 80% of soy is produced most farms are medium to large size, from 150 to over 30,000 hectares<sup>(36)</sup>. Timber is produced by growers of all size, from larger commercial plantations to smallholdings<sup>(37)</sup>.

Companies need to understand the type of farmers they are sourcing from to develop effective producer engagement. Engaging with smallholder farmers spread out over often remote rural areas can be particularly challenging. Multisectoral partnerships with NGOs and local governments who already have a presence in producer communities are emerging as a way for companies to scale interventions more quickly and effectively. Sustainable certification organisations like Rainforest Alliance and farmer-focused NGOs such as the Sustainable Agricultural Network have also developed best practice step-by-step guidance to engage with producers and improve the sustainability of their agricultural practice<sup>(38)</sup>.

The scale of funding required to effectively tackle deforestation and improve the sustainability of agriculture and forestry is huge and well beyond the means of any one company. Multisectoral initiatives bringing together companies, NGOs and governments, such as the Livelihoods Fund led by companies including Danone and Mars, can help to overcome funding challenges and drive the systematic changes needed to tackle deforestation. Where such partnerships have worked with producers to develop locally owned sustainable agriculture and good forest governance, some communities have been able to leverage further funding and support from government, NGOs and funders beyond the supply chain<sup>(38)</sup>.

**Figure 54: Livelihoods fund producer engagement methodology**



Source: CDP, Livelihoods Fund

Corporate zero deforestation initiatives need to consider farm economics - clearing forest to establish farms and plantations is often the cheapest option available to farmers. Strengthening the business case for forest protection and sustainable agriculture at the farm level is key to engaging farmers.

Zero deforestation initiatives promoting diversified production systems, like including economically useful trees and crops on soy or cattle farms can increase and diversify producer's income. Well-managed diversified systems such as agroforests improve conditions for agricultural production and increase farmers' capacity to adapt to climate change. They also contribute to climate change mitigation by increasing on-farm carbon stocks and can bring wider benefits such as improving local food security and biodiversity.

It is essential for companies to engage with producers to halt deforestation and improve the sustainability of agricultural and forestry production. Whilst multisectoral partnerships may provide some opportunities to tackle forest loss at scale, commodities often pass through several actors in the supply chain, before they reach the companies analysed in this report. Consumer goods companies must therefore engage with actors all along the supply chain to tackle deforestation.

(34) Santika et al., Does oil palm agriculture help alleviate poverty? A multidimensional counterfactual assessment of oil palm development in Indonesia

(35) Rojas-Downing et al., Climate change and livestock: Impacts, adaptation, and mitigation

(36) WWF, The Growth of Soy: Impacts and solutions

(37) Food and Agriculture Organization of the United Nations, Global Forest Resources Assessment 2015: How are the world's forests changing?

(38) Brannstrom et al., Compliance and market exclusion in Brazilian agriculture: analysis and implications for "soft" governance

# Appendix I: Company engagement traffic light system

League Table rank	Companies	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	21
		Danone	Nestlé	L'Oréal	Unilever	Kellogg's	Mars	PepsiCo	McDonald's	General Mills	Kao	Fonterra	RB	Colgate-Palmolive	P&G	Campbell's	Mondelez	Yumi Brand	Estée Lauder	ConAgra	Kraft Heinz	RBI	Tyson Foods	
<b>Transition risks rank</b>																								
	Sustainable Consumption	3	8	9	20	10	13	5	16	12	17	1	7	6	15	2	19	14	11	18	4	21	22	22
	Sustainable Production	10	5	18	17	13	16	6	8	7	22	1	9	11	15	3	21	4	14	20	2	12	19	19
	Capital Resilience	1	15	9	20	2	6	11	19	16	12	5	10	7	17	3	13	17	14	4	8	21	22	22
	Land Use	14	6	1	9	19	7	10	12	11	4	22	8	3	5	18	13	16	2	20	21	17	15	15
		12	16	3	13	10	18	8	19	4	11	5	15	21	7	14	6	9	1	17	2	20	22	22
<b>Physical risks: water resilience</b>																								
	Palm Oil	5	6	8	4	7	2	13	18	12	19	14	9	3	10	11	1	21	20	15	17	22	16	16
	Soy	4	6	11	2	7	5	9	16	8	16	13	9	3	12	15	1	16	16	16	14	16	16	16
	Timber	2	10	5	6	8	14	16	15	16	n/a	7	11	9	11	1	11	16	16	3	16	16	3	3
	Cattle	7	10	11	19	8	5	18	12	17	4	3	9	16	12	6	12	15	1	2	20	20	20	20
		11	6	n/a	11	n/a	4	11	7	11	n/a	11	7	5	9	3	9	11	11	2	11	11	1	1
<b>Transition opportunities rank</b>																								
	Sustainable Consumption Innovation	6	5	3	1	9	2	18	4	10	7	12	16	20	13	21	14	8	15	19	22	17	11	11
	Sustainable Production Innovation	16	11	4	1	13	5	19	6	17	7	15	18	19	10	19	19	2	7	13	12	7	2	2
	Brand Level Development	1	7	6	3	7	2	10	4	5	12	9	15	18	16	17	11	14	18	21	22	18	13	13
	Research & Development	18	1	19	3	6	12	21	2	15	17	4	10	8	16	9	11	5	14	13	20	7	22	22
	Progress on Timber / Soy / Cattle Use	10	4	2	7	12	15	14	20	11	1	17	6	5	3	13	8	20	9	16	18	20	19	19
		19	7	3	5	18	12	15	17	20	2	14	11	13	7	16	7	4	6	1	20	20	7	7
<b>Deforestation Governance &amp; Strategy</b>																								
	Deforestation Strategy	5	3	6	1	2	8	7	9	10	4	16	12	11	13	17	13	18	19	15	22	20	21	21
	Board Level Management Score	6	3	8	2	5	3	7	12	9	1	14	15	13	10	17	11	19	18	16	20	21	22	22
	Risk Management Process Score	3	1	10	2	5	19	7	4	9	16	17	6	8	14	12	11	19	18	13	21	22	15	15
	Company-Wide Deforestation Ambition	17	10	7	9	3	4	14	2	18	5	14	1	6	10	20	10	16	19	13	22	8	21	21
	CDP Score	1	1	1	7	1	7	11	1	7	1	18	14	7	12	12	16	17	18	21	18	14	22	22
		1	20	1	5	7	9	1	19	6	1	11	15	14	20	16	20	9	11	8	18	11	17	17
<b>Total</b>																								
	Green	8	6	7	8	5	6	1	5	2	8	5	1	3	2	4	1	4	3	5	2	0	3	3
	Yellow	3	6	6	5	7	5	9	3	7	2	2	9	8	5	3	8	2	3	1	1	3	1	1
	Orange	3	5	2	2	3	4	3	3	3	4	6	7	3	9	5	5	6	4	6	2	4	3	3
	Red	4	1	2	3	2	3	5	7	6	2	5	1	4	2	6	4	6	8	6	13	11	11	11

Note: weighted ranks are calculated for each area. We display non-weighted ranks in this summary for simplicity only.

Source: CDP

This heat map is designed to help investors pinpoint priority areas for engagement.

**Green** = good performance  
**Yellow** = reasonable performance  
**Orange** = monitor performance, possible concern  
**Red** = area of concern, engage with company

We have not assigned a uniform number of green, yellow, orange and red colours across the metrics according to rank. Instead, we have reviewed the results of each metric in detail and assigned the above colours according to the underlying values for each metric.

# Appendix II: Company summaries

## Tyson Foods

Market cap 14 November 2019: US\$ 32 bn

Country: USA

Revenue split by business area (%)



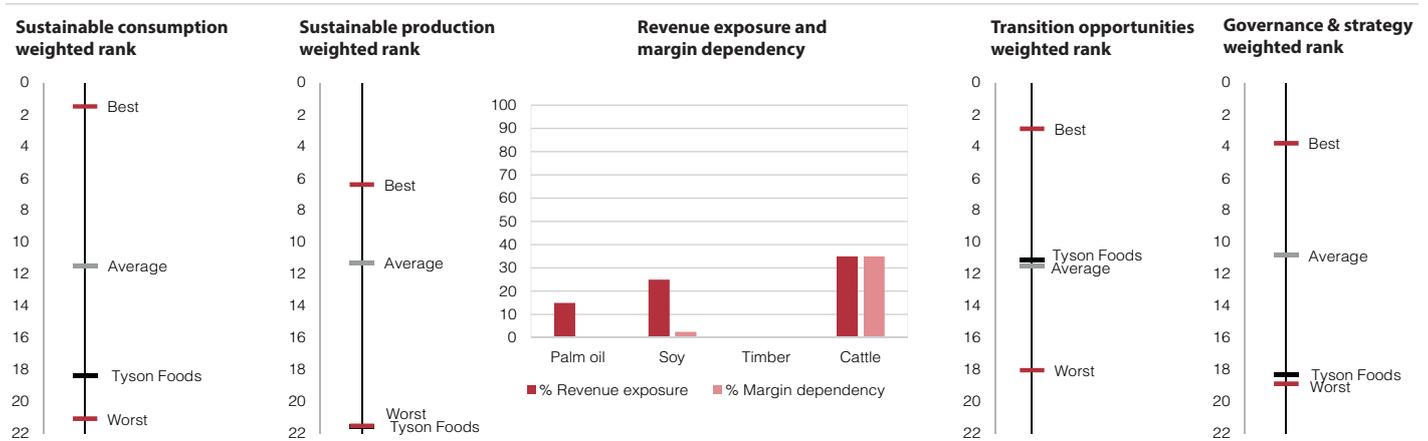
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
TSN US	22 / 22	22	16	11	21

### Company strengths

- ▶ Cattle and soy sourcing from countries with low physical risks of future deforestation.
- ▶ Tyson Foods ranks second for sustainable consumption innovations; co-led a seed investment round for Future Meat Technologies.

### Company Weaknesses

- ▶ At least 20% of Tyson Food's revenue is dependent on soy and 30% on cattle.
- ▶ Purchases 2.2 million metric tons of soymeal for poultry feed and 6.6 million cattle a year.
- ▶ Do not disclose palm oil related risks.
- ▶ Lack of disclosure on deforestation risk management processes.
- ▶ No company-wide deforestation commitment.



## RBI

Market cap 14 November 2019: US\$ 31 bn

Country: Canada

Revenue split by business area (%)



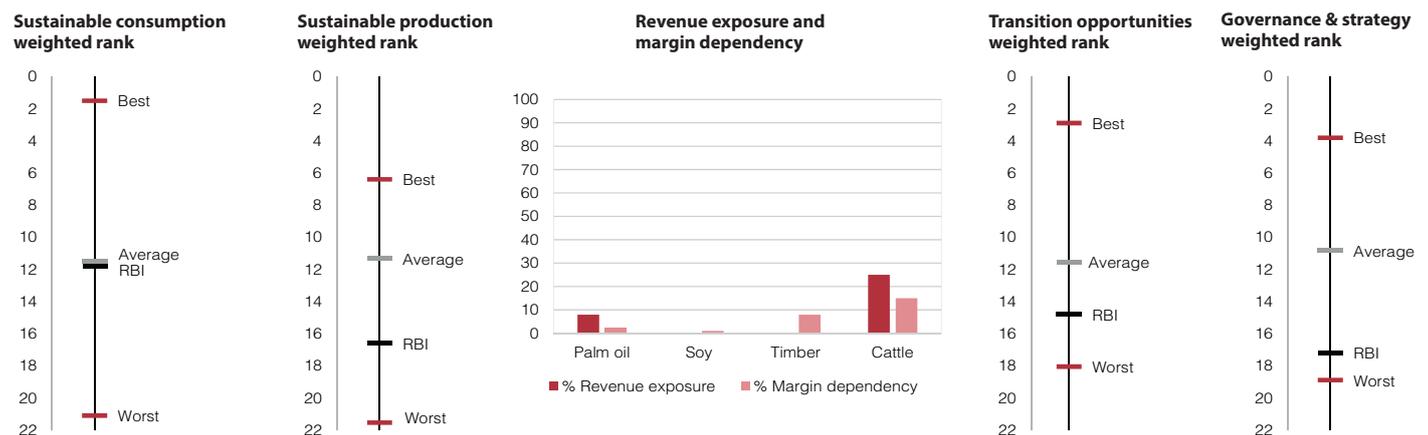
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
QSR CN	21 / 22	21	22	17	20

### Company strengths

- ▶ Burger King brand has developed and launched plant-based burger products.

### Company Weaknesses

- ▶ Poor certification and traceability disclosure for all FRC exposures.
- ▶ Lack of investment in transformative regenerative agriculture or landscape approaches to forest protection.
- ▶ No publicly disclosed palm oil mill list. Soy, timber and cattle supply disclosure is weak.
- ▶ No reported commitments to develop supply chain traceability systems.



# Kraft Heinz

Market cap 14 November 2019: US\$ 41 bn

Country: USA



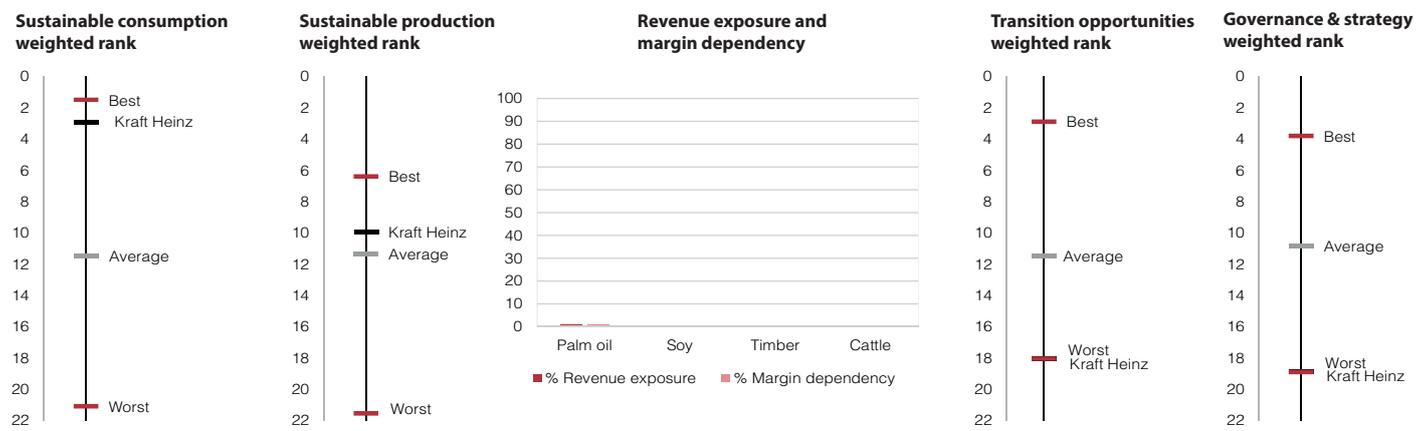
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
KHC US	20 / 22	4	17	22	22

## Company strengths

- ▼ Kraft Heinz scores second on Transition Risks with less than 1% revenue dependence on palm oil, which accounts for less than 1% of Kraft Heinz's procurement costs.
- ▼ 100% physically certified palm oil.
- ▼ Developing a range of plant-based meat products.

## Company Weaknesses

- ▼ No disclosure of cattle, soy and timber exposure.
- ▼ Lack of investment in regenerative agriculture or landscape approaches.
- ▼ The company identifies and assesses forest-related risks associated with palm oil once every two years.
- ▼ Commodity specific deforestation commitment rather than company-wide deforestation commitment.



# Conagra

Market cap 14 November 2019: US\$ 14 bn

Country: USA



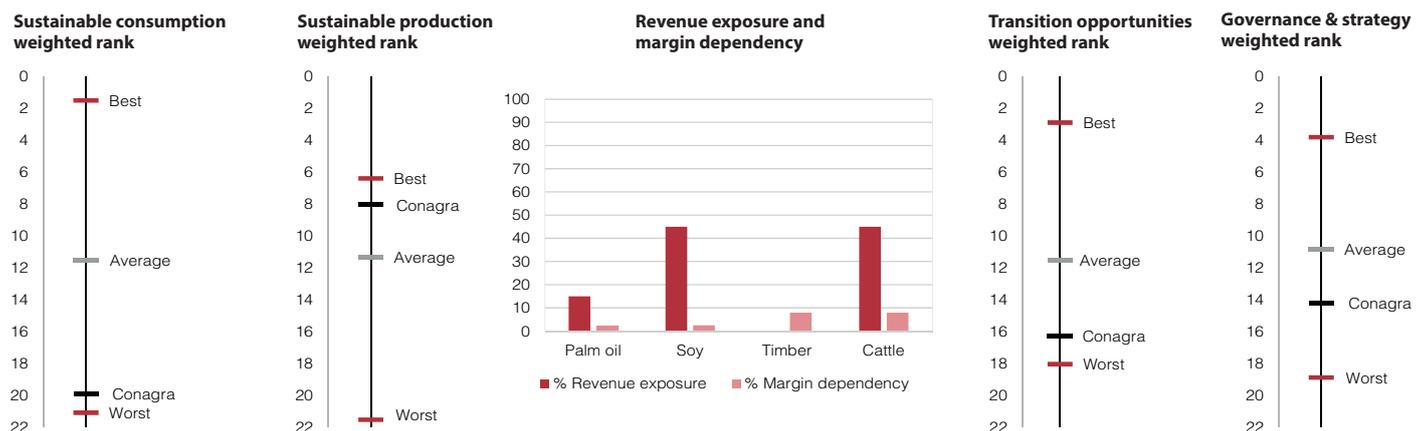
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
CAG US	19 / 22	18	15	19	15

## Company strengths

- ▼ Soy, cattle and timber sourced from countries with low physical risks of future deforestation.
- ▼ Low volumes of FRCs used.
- ▼ Ranks top for FRC traceability, tracing 100% of its FRCs to mill/ slaughterhouse / forest management unit.
- ▼ The Gardein brand has been developing plant-based meat products.

## Company Weaknesses

- ▼ At least 40% of ConAgra's revenue is dependent on cattle and soy.
- ▼ No publicly disclosed palm oil mill list.
- ▼ 50% of ConAgra's palm oil supply is physically certified.
- ▼ Lack of investment in regenerative agriculture or landscape approaches.
- ▼ No company-wide deforestation commitment.
- ▼ High level of debt; close to 7x net debt / EBITDA.



# Estée Lauder

Market cap 14 November 2019: US\$ 68 bn

Country: USA



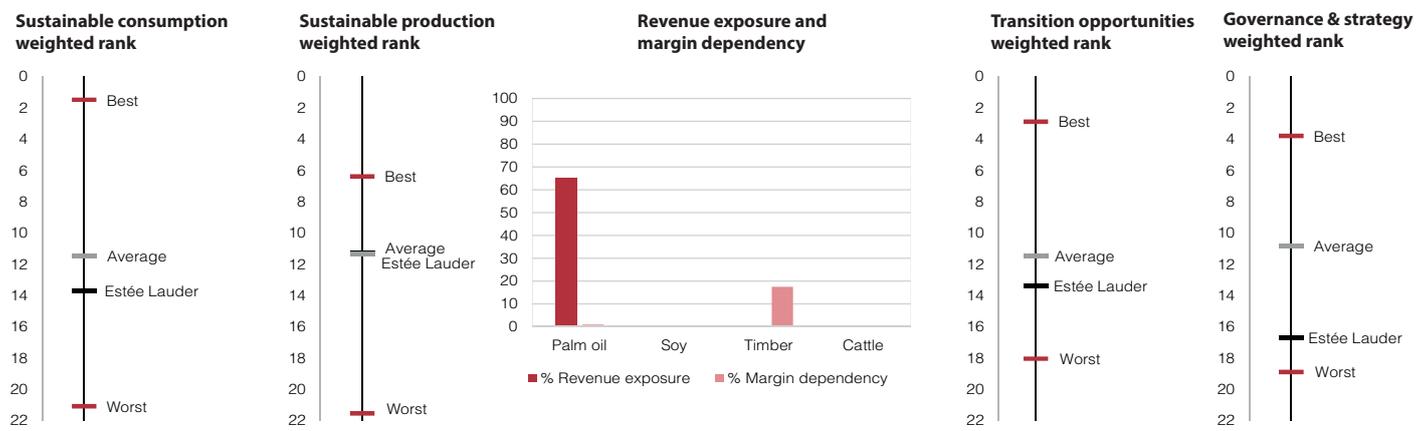
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
EL US	18 / 22	11	20	15	19

## Company strengths

- Small volume of palm oil derivatives procured.
- No debt, high free cash flow conversion.
- Developed vegan product ranges across a number of cosmetics brands

## Company Weaknesses

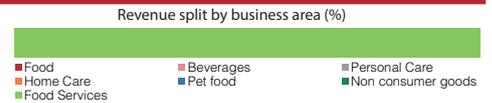
- No publicly disclosed palm oil mill list.
- Less than 50% physically certified palm oil products.
- 61-70% revenue dependent on palm oil.
- Low certification of paper and pulp supply.
- Lack of investment in regenerative agriculture or landscape approaches.



# Yum! Brands

Market cap 14 November 2019: US\$ 30 bn

Country: USA



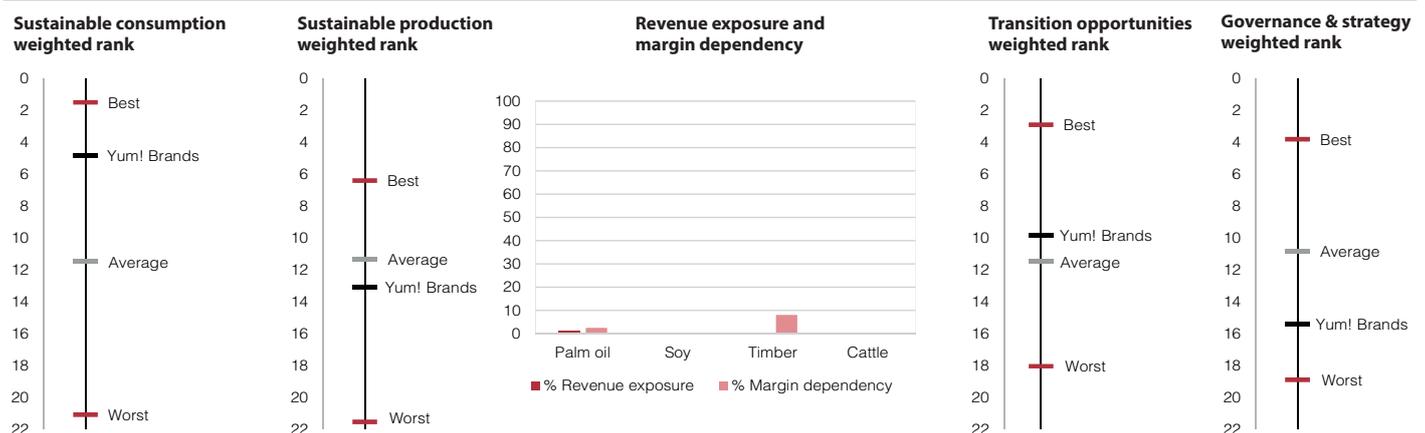
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
YUM US	17 / 22	14	21	8	18

## Company strengths

- Small revenue dependency on palm oil which is used for frying and could be substituted for other oils.
- Ranks second in sustainable consumption innovation, with investments in plant protein alternatives, food waste programmes and packaging innovations.
- KFC brand has developed plant-based chicken alternatives.

## Company Weaknesses

- No publicly disclosed palm oil mill list.
- No disclosure of soy and cattle supply.
- Large volumes of palm oil and timber consumed.
- 30% of palm oil supply is physically certified.
- No reported commitments to develop supply chain traceability systems.



# Mondelez

Market cap 14 November 2019: US\$ 76 bn

Country: USA



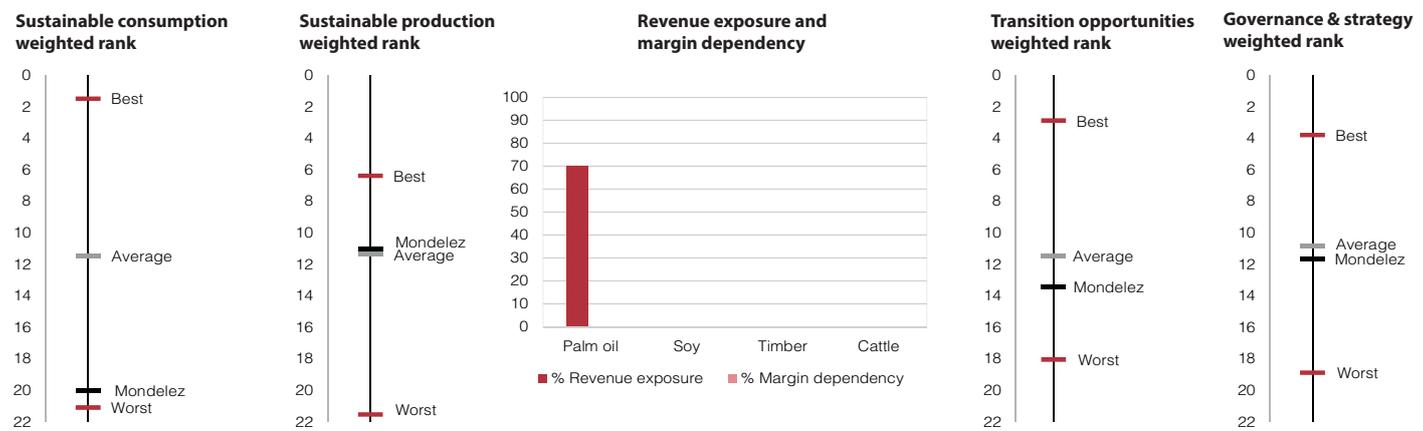
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
MDLZ US	16 / 22	19	1	14	13

## Company strengths

- Comes top in relation to physical risks associated with current location of palm oil supply.
- Sustainable production innovations; Cocoa Life program and Harmony Wheat program.

## Company Weaknesses

- Non-respondent for CDP Forests 2019.
- 60-80% of revenue dependent on palm oil.
- 2% physically certified palm oil. Balance covered by Book and Claim credits.
- Commodity-specific and not company-wide deforestation commitment.
- Large volumes of palm oil and timber required.



# Campbell's

Market cap 14 November 2019: US\$ 14 bn

Country: USA



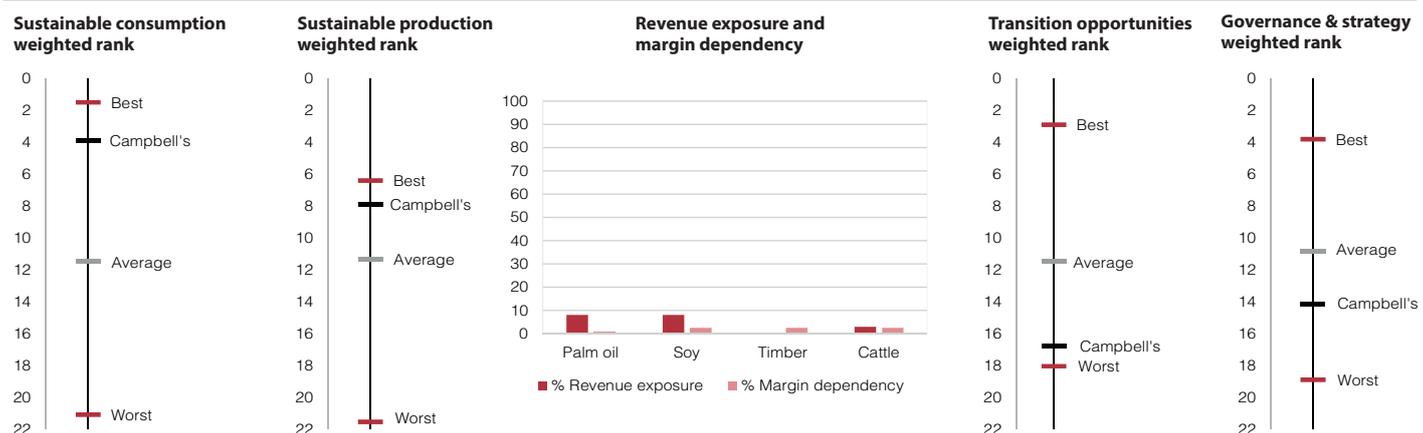
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
CPB US	15 / 22	2	11	21	17

## Company strengths

- Ranks second in transition risks, with each FRC accounting for less than 10% of group revenue.
- Good disclosure across FRCs and only procuring small volumes of each FRC.
- 100% physically certified palm oil.

## Company Weaknesses

- Lack of investment in regenerative agriculture.
- No defined frequency for assessment of deforestation risks relating to palm oil.
- No certification of paper and pulp supply.
- Net debt / EBITDA 6x.
- Palm oil mill list indicate relatively high physical risk associated with current location of palm oil mills.





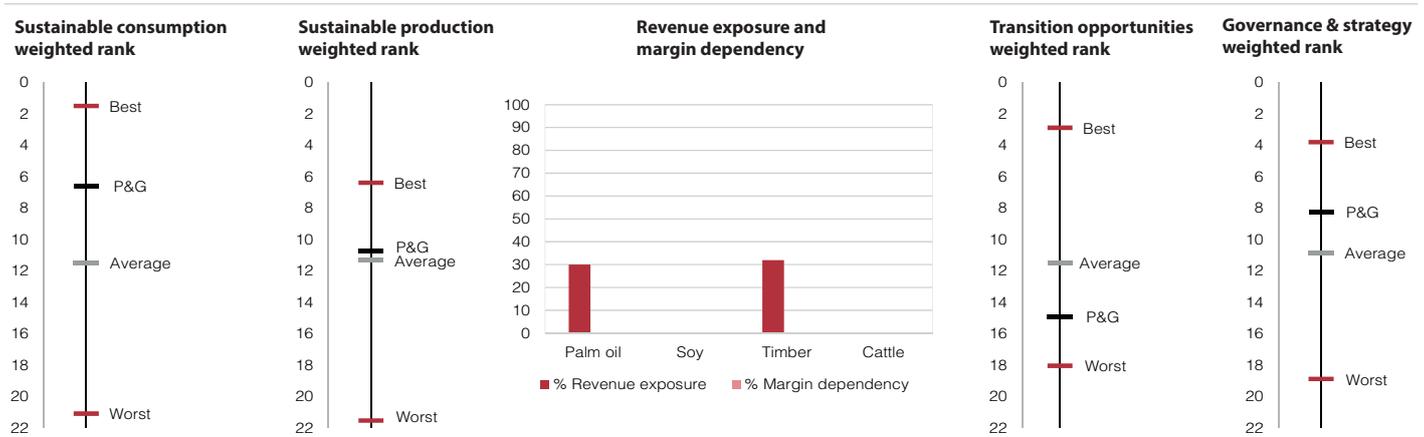
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
PG US	14 / 22	15	10	13	13

## Company strengths

- 100% traceability of palm oil to collection centres.
- Developing innovative Forest Positive products.

## Company Weaknesses

- Non-respondent to CDP Forests 2019.
- 20-40% revenue dependent on palm oil.
- Exposure to paper and pulp due to sanitary care and paper towels business; P&G buys 1.5 million in pulp for personal care products.
- Concentrated brand portfolio, top 10 brands account for more than 50% of group revenue.
- 34% physically certified palm oil.



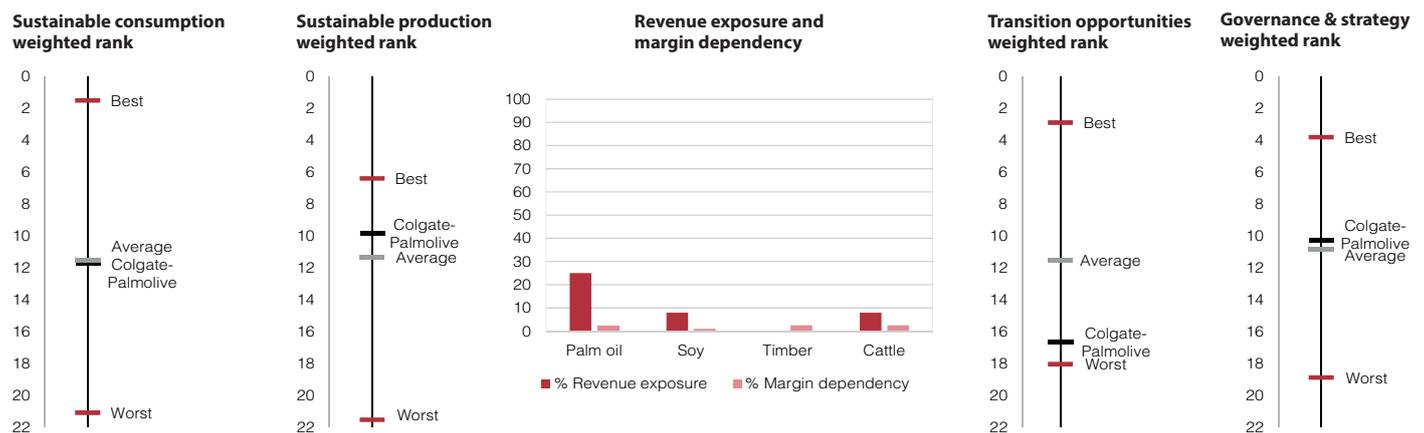
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
CL US	13 / 22	6	3	20	11

## Company strengths

- Palm oil sourced from countries with low physical risks of future deforestation.
- 90% of brands with direct or indirect management of FRCs.
- Good risk assessment of deforestation risks associated with palm oil; full value chain assessed every 6 months.
- Partnered with NGO to engage Indonesian palm oil producers in more sustainable production.

## Company Weaknesses

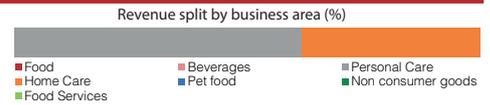
- Exposure to tallow used in soaps.
- Less than 50% of palm oil supply is physically certified.
- Lack of sustainable consumption and production innovation.
- 21-30% revenue dependent on palm oil.



# RB

Market cap 14 November 2019: US\$ 54 bn

Country: UK



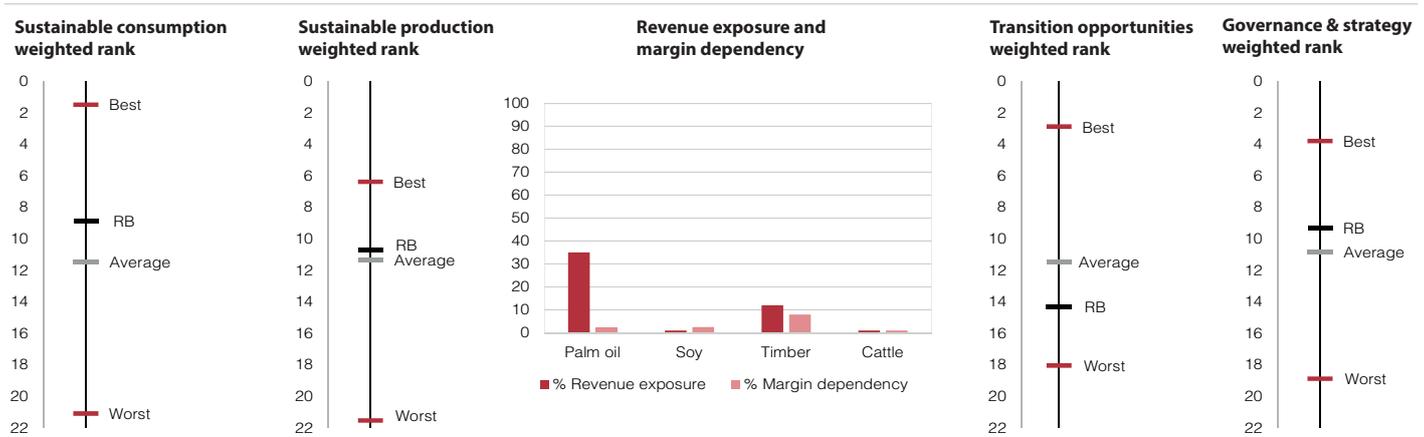
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
RB/LN	12 / 22	7	9	16	12

## Company strengths

- Rank first in deforestation related risk management, assessing risks associated with all FRC exposures annually.
- Small volumes of FRC required.
- 90.5% certified forestry products.
- Developed vegan baby formulas through infant nutrition brands.
- Involved in a pilot to monitor land-use change in palm oil growing regions.

## Company Weaknesses

- Exposure to tallow used in soaps.
- 7.4% physically certified palm oil.
- 31-40% revenue dependent on palm oil.
- Lack of investment in sustainable consumption opportunities.



# Fonterra

Market cap 14 November 2019: US\$ 4 bn

Country: New Zealand



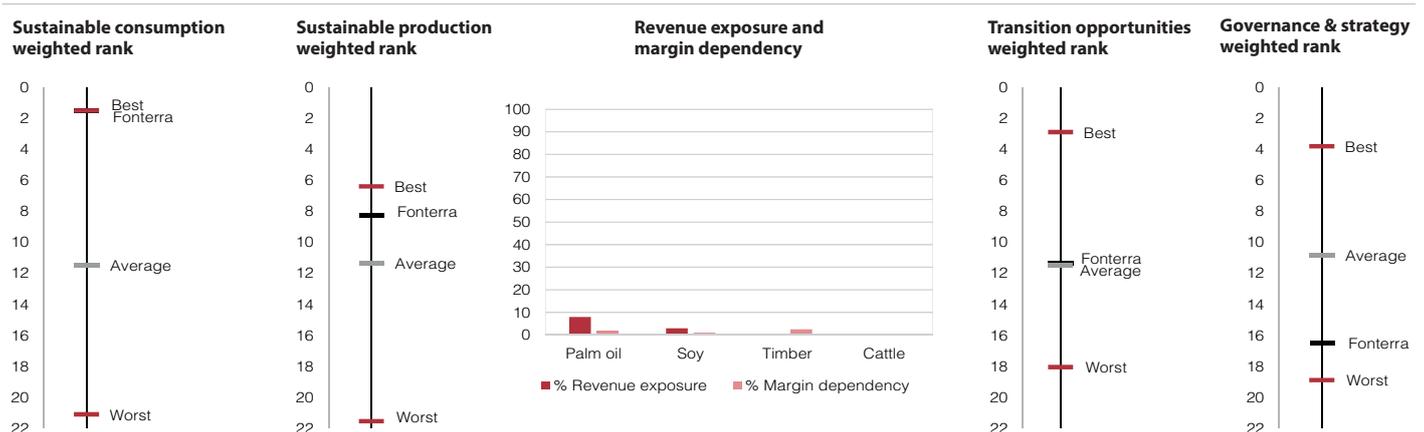
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
FSF/NZ	11 / 22	1	14	12	16

## Company strengths

- Rank first in Transition Risks, with low cost exposure and low revenue dependency on FRC.
- Timber sourced from countries with low physical risks of future deforestation.
- Diversified portfolio, top 10 brands account for less than 40% of revenue.

## Company Weaknesses

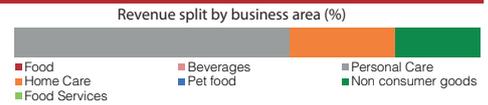
- High level of financial leverage, net debt / EBITDA 7.8x.
- Commodity specific deforestation commitment rather than company-wide commitment.
- Low level of palm oil certification – small volumes of certified palm kernel expeller in the market.



# Kao

Market cap 14 November 2019: US\$ 38 bn

Country: Japan



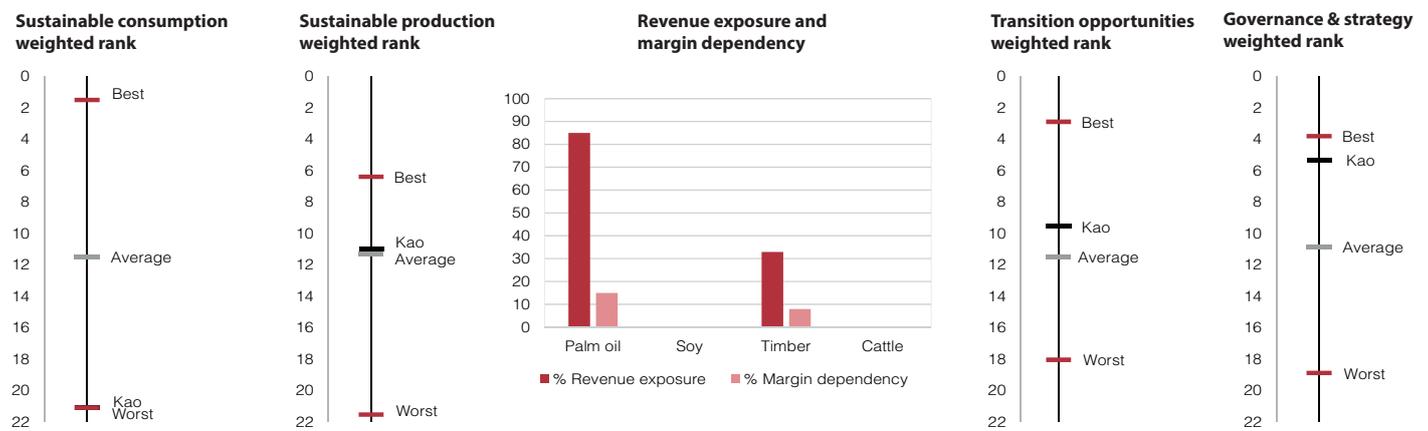
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
4452 JP	10 / 22	17	19	7	4

## Company strengths

- Company-wide zero deforestation commitment.
- Traces 100% of its supply of timber to the forest of origin.
- Company reported exposure to timber and palm oil and has commodity specific policies in place for both commodities.
- Partnered with NGO to develop farm-level palm oil traceability.

## Company Weaknesses

- 81-90% of revenue dependent on palm oil, reported to contribute to 11-20% of procurement costs.
- Exposure to forestry product with its sanitary and nappy care businesses.
- No public disclosure of palm oil mill list.
- 16% physically certified palm oil.



# General Mills

Market cap 14 November 2019: US\$ 32 bn

Country: USA



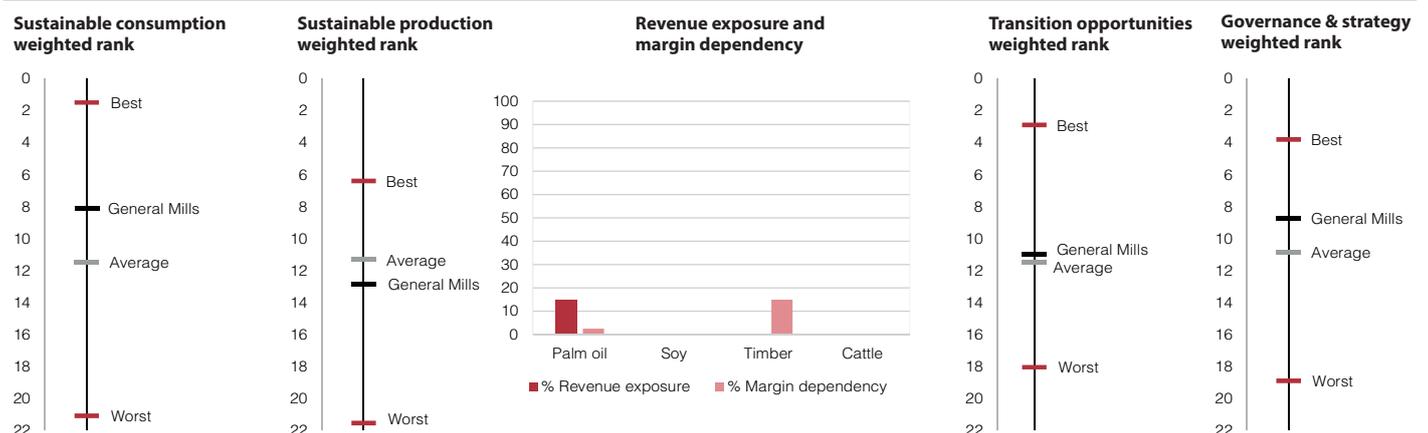
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
GIS US	9 / 22	12	12	10	10

## Company strengths

- Less than 20% revenue dependency on palm oil.
- Investment in sustainable production opportunities including innovation in regenerative agriculture and soil health programs.

## Company Weaknesses

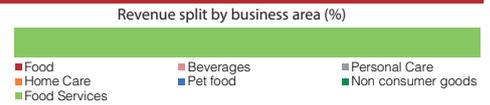
- Low traceability of timber and palm oil.
- Does not specify a certification scheme for timber.
- 11-20% of procurement costs due to forestry products.
- Light on sustainable consumption innovations.



# McDonald's

Market cap 14 November 2019: US\$ 147 bn

Country: Global



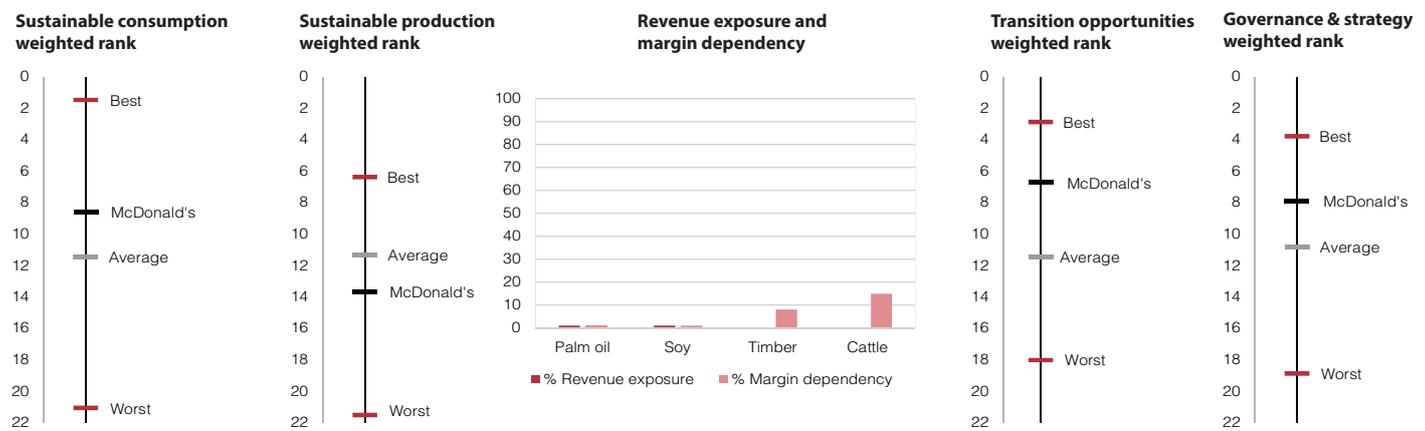
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
MCD US	8 / 22	16	18	4	9

## Company strengths

- Company-wide zero deforestation commitment.
- Strong oversight of deforestation with both board- and executive-level sustainability committee.
- Good risk management in place, assessing deforestation risks as a standalone issue on a six-monthly basis.
- Novel alternative feed for chicken to reduce dependency on soy.

## Company Weaknesses

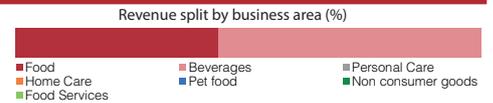
- 11-20% of procurement costs dependent on cattle.
- No public disclosure of palm oil mill list.
- Large volume of forestry product and cattle consumed.
- No commitments or targets relating to traceability of timber and palm oil in supply chain. Targets have been focused on third-party verification.



# PepsiCo

Market cap 14 November 2019: US\$ 186 bn

Country: USA



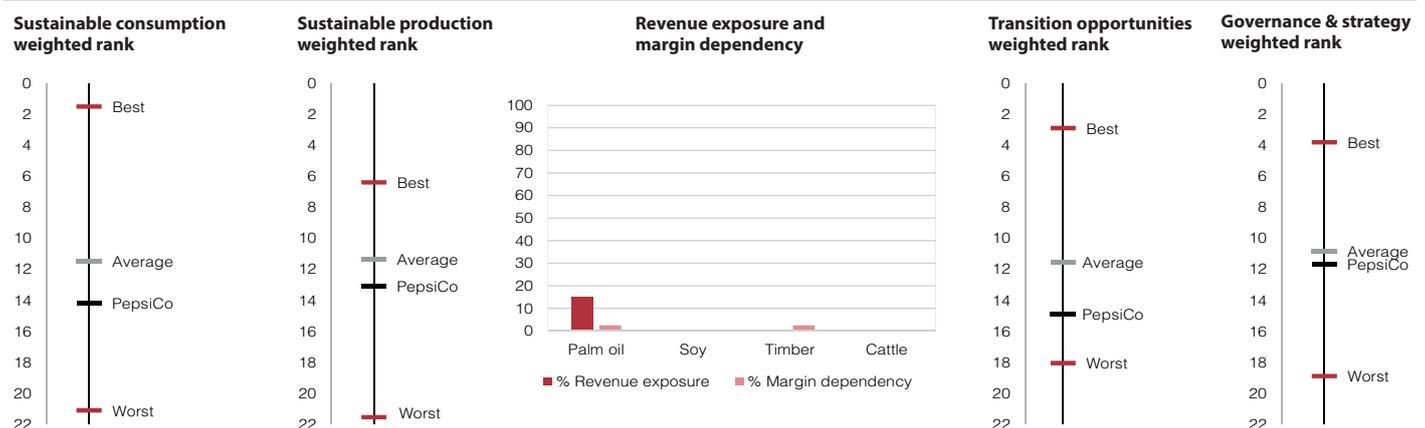
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
PEP US	7 / 22	5	13	18	7

## Company strengths

- Less than 5% of procurement costs dependent on either timber or palm oil.
- Less than 20% of revenue dependent on palm oil.
- Traceability and certification targets set for palm oil.
- 100% traceability of forestry products to mill of origin.

## Company Weaknesses

- Performs poorly on Transition Opportunities.
- High volume user of timber and palm oil.
- No disclosure of soy and cattle exposure.



# Mars

Market cap 14 November 2019: Private company

Country: USA

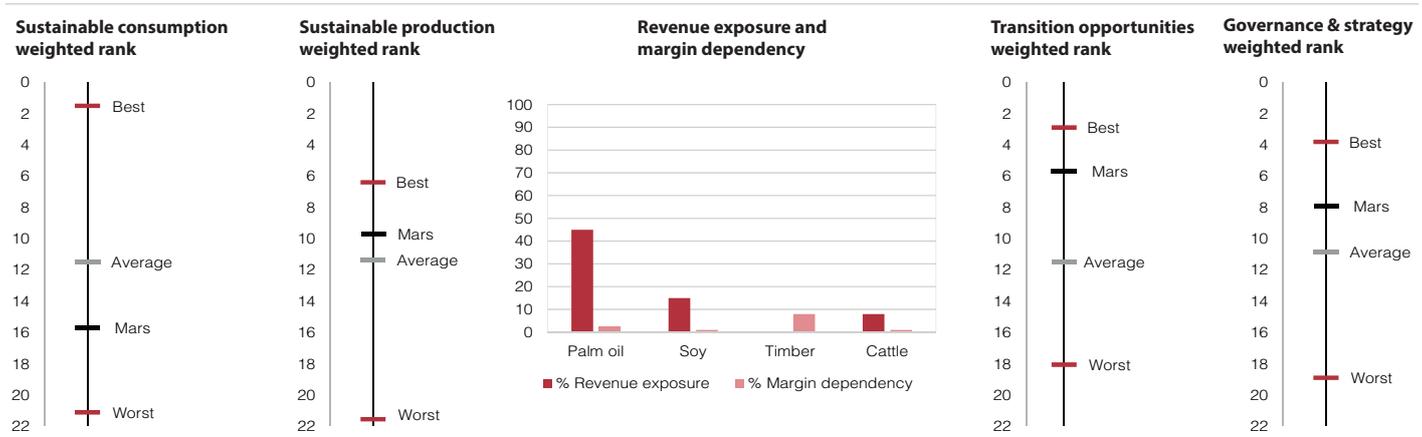
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
PRIVATE	6 / 22	13	2	2	8

## Company strengths

- Only company with public commitment to hold flat the amount of land used in value chain.
- 100% physically certified palm oil.
- Sources palm oil, timber and cattle from low-deforestation risk areas.
- Ranks second in Transition Opportunities.
- Developed vegan product ranges.

## Company Weaknesses

- 41-50% revenue dependent on palm oil.
- Privately run company and hence scores poorly on board level management.



# Kellogg's

Market cap 14 November 2019: US\$ 22 bn

Country: USA



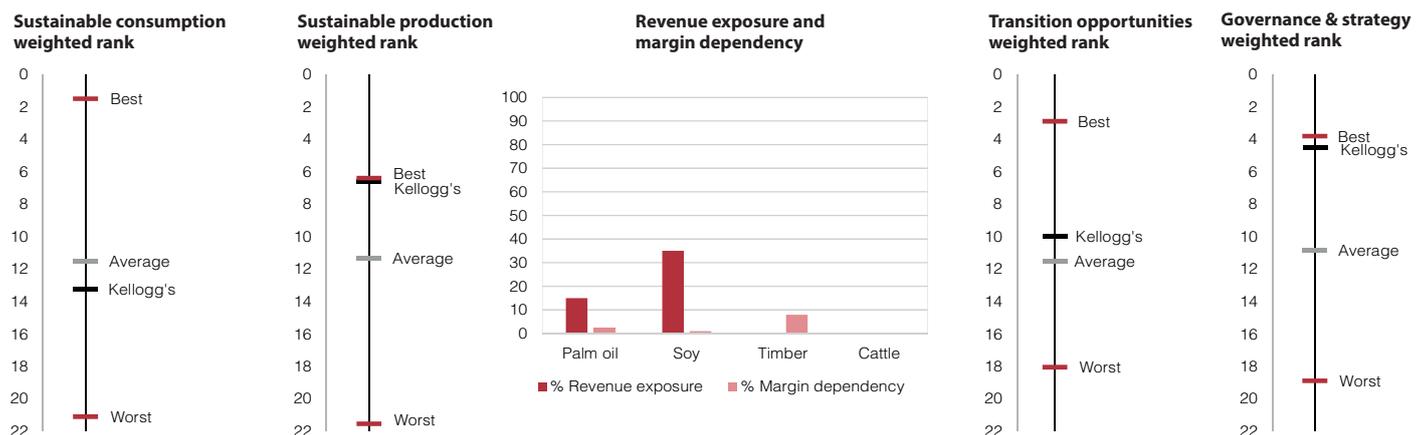
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
K US	5 / 22	10	7	9	2

## Company strengths

- Zero deforestation commitment across entire supply chain.
- Ranks second in Sustainable Production.
- 100% certification of paper and pulp supply.
- No reported cattle exposure.
- Assesses deforestation risks on a six-monthly basis.
- Developed plant-based meat products.

## Company Weaknesses

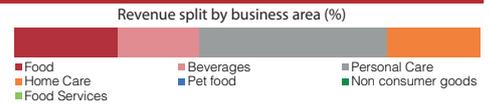
- 31-40% of revenue dependent on soy.
- Lack of sustainable consumption opportunities.



# Unilever

Market cap 14 November 2019: US\$ 160 bn

Country: UK / Netherlands



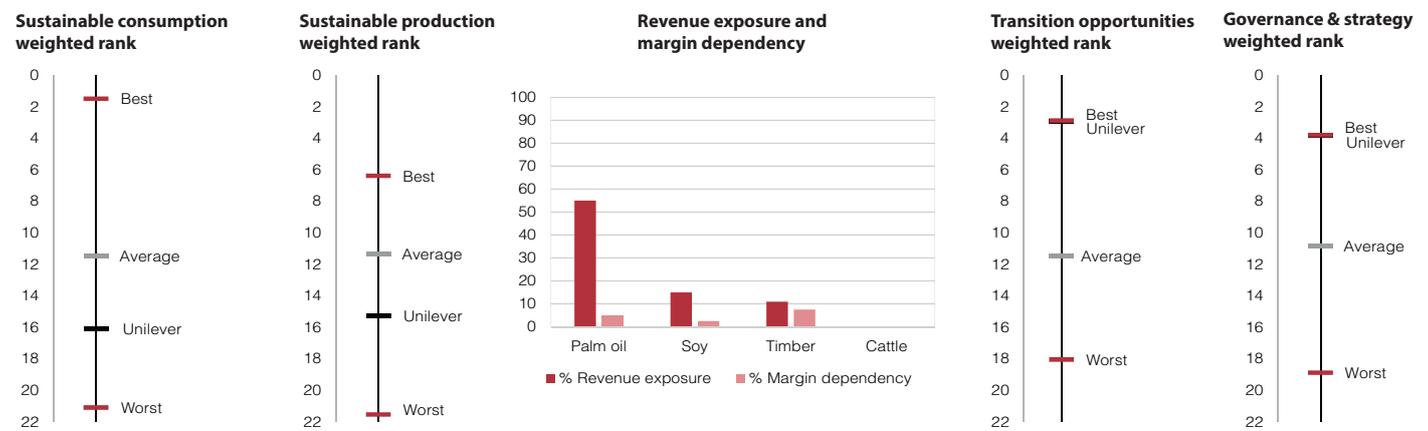
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
ULVR LN	4 / 22	20	4	1	1

## Company strengths

- Sources palm oil from countries with low physical risks of future deforestation.
- Ranks top in Sustainable Consumption and Production Opportunities.
- Board members with strong sustainability expertise; including a climate leader for the World Bank Group and Chairman of the Alliance for a Green Revolution in Africa.

## Company Weaknesses

- Huge volume consumer of palm oil, soy and timber. Unilever's reported consumption of palm-based ingredients was 1.03 million tonnes, of which 785,000 tonnes is palm oil, 450,000 tonnes of palm kernel oil and palm oil derivatives. This represents 5.8% of global volumes of certified palm oil and 15% of global volumes of certified palm kernel oil.



# L'Oréal

Market cap 14 November 2019: US\$ 161 bn

Country: France



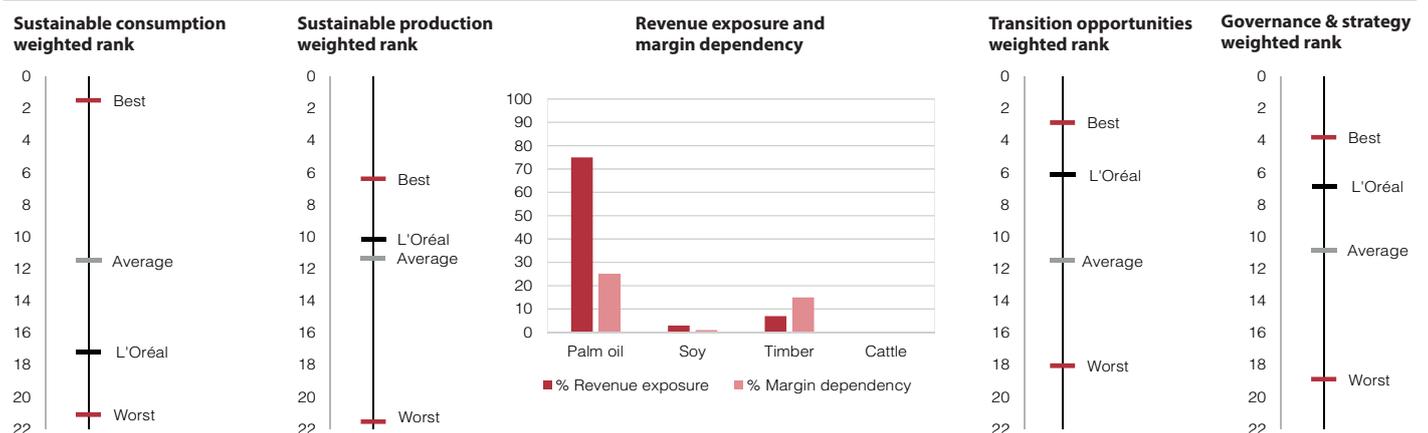
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
OR FR	3 / 22	9	8	3	6

## Company strengths

- Zero deforestation commitment across entire supply chain.
- Small volume exposure to palm oil, soy and timber.
- 99% of timber supply certified.
- No reported cattle exposure.
- High free cash flow conversion, higher EBITDA margins and net cash.
- Third in Transition Opportunities, investing in innovations in both sustainable consumption and sustainable production.

## Company Weaknesses

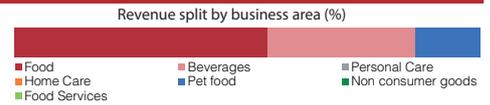
- High exposure to palm oil derivatives and palm kernel oil.
- 70-80% reported dependency on palm oil related products.
- 20-30% of procurement costs due to palm based material.



# Nestlé

Market cap 14 November 2019: US\$ 314 bn

Country: Switzerland



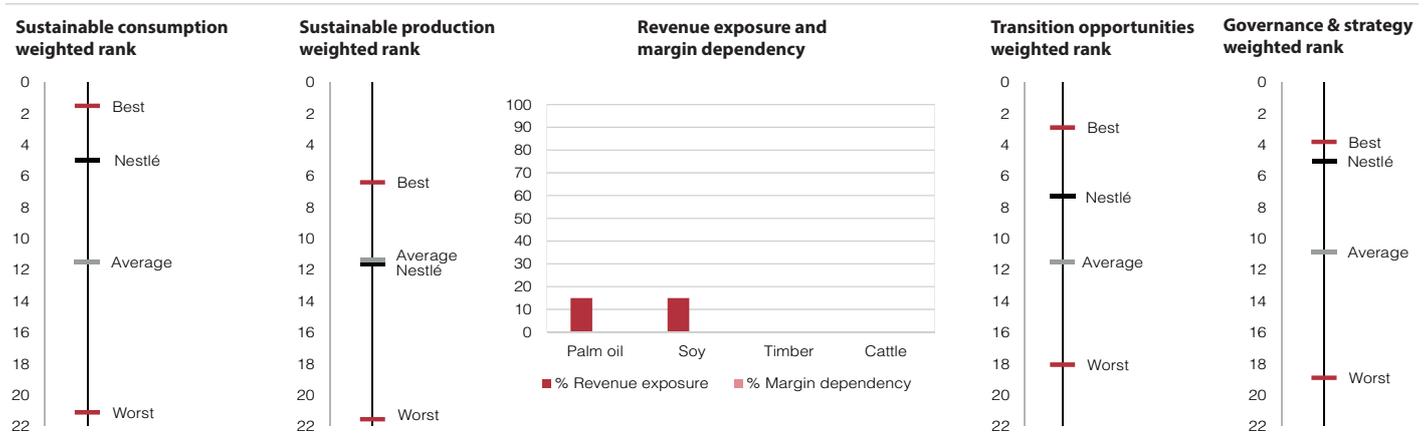
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
NESN SW	2 / 22	8	6	5	3

## Company strengths

- Zero deforestation commitment across entire supply chain.
- Strong board leadership including a former US Department of Agriculture Secretary.
- Direct management of forest-related risks across the company's top brands.
- Diversified brand portfolio.

## Company Weaknesses

- No CDP Forest 2019 disclosure.
- Large volume exposure to palm oil and timber.
- Low traceability and certification of palm oil supply.



# Danone

Market cap 14 November 2019: US\$ 56 bn

Country: France



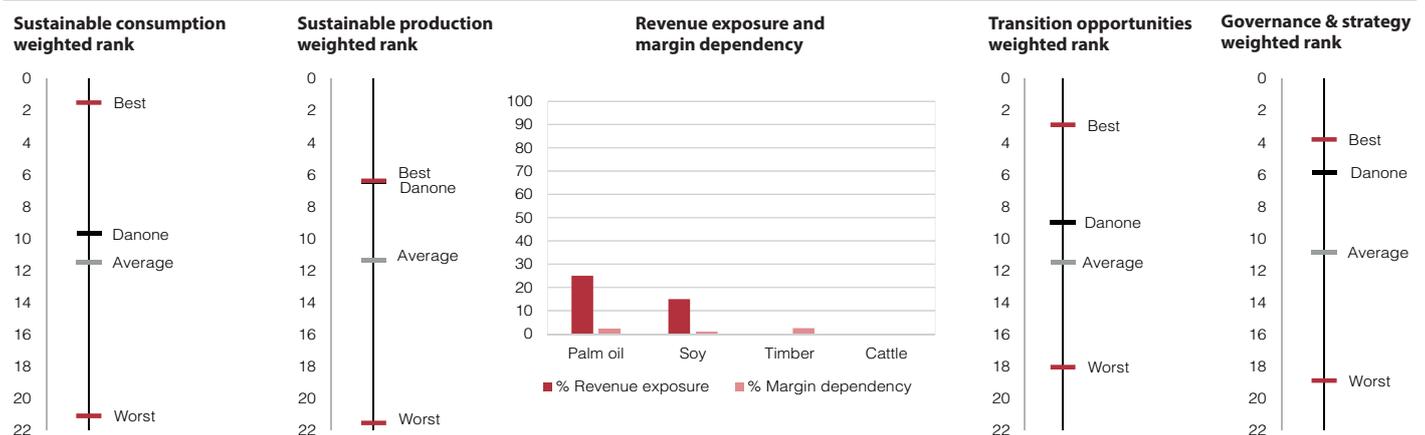
Ticker	League Table rank	Transition risks rank	Physical risks rank	Transition opportunities rank	Governance & strategy rank
BN FP	1 / 22	3	5	6	5

## Company strengths

- Zero deforestation commitment across entire supply chain.
- Each FRC exposure contributes to less than 5% of procurement costs.
- 98% physically certified palm oil, 79% certified timber.
- Palm oil, soy and timber from countries with low physical risks of future deforestation.
- First on sustainable production opportunities; launched a soil health initiative.

## Company Weaknesses

- 21-30% of revenue dependent on palm oil.
- Large volume exposure to soy.
- Limited sustainable consumption opportunities.
- Top 10 brands account for more than 80% of revenue.







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