FEEDING DEFORESTATION

How Millions of Tons of Palm Oil Goes Unaccounted for in the Form of Animal Feed

RAINFOREST ACTION NETWORK

EXECUTIVE SUMMARY

PHOTO: Paul Hilton / RAN

Palm oil, found in roughly half of all packaged goods in the average American grocery store, is one of the most widely used oil products in the world, found in everything from shampoo, cookies and crackers, to biofuels. Its production, however, is fraught. In just the past few decades, palm oil has become one of the main drivers of rainforest deforestation globally and is associated with widespread human rights abuses. According to recent reports,[1] palm oil contributes more to tropical deforestation than any other commodity consumed by Americans. Conflict Palm Oil — or palm oil made at the expense of rainforests, carbon rich peatlands, and human rights — has flooded the market as major producer countries like Indonesia and Malaysia have sought to keep pace with demand.

In response to the growing crisis and in the wake of significant public pressure, major consumer goods companies — the buyers of much of that palm oil — responded by introducing buying policies and traceability systems, meant to curb the amount of Conflict Palm Oil entering global supply chains. The leading standard, known as a 'No Deforestation, No Peatland, No Exploitation' (NDPE) policy, should ensure that there is no Conflict Palm Oil anywhere in a company's supply chain. Many companies with NDPE policies in place champion themselves and their products as "deforestation-free".

New research by Rainforest Action Network (RAN) has found, however, that there is a rapid increase in the use of palm oil as an animal feed additive, particularly for dairy cows (also called embedded palm oil). Industry experts in the United States have said that the use of palm oil-based animal feed has "exploded" in recent years. And yet, much of the international trade in palm oil-based animal feed is obscured for consumers and other stakeholders.

By analyzing more than 30,000 shipments entering the United States in 2022 — the country and year for which the most complete data was available — RAN's investigation not only found that palm oil-based animal feed is now the single largest palm oil product category imported to the United States, it also revealed that the world's ten largest dairy processing companies and many global consumers goods companies are not currently accounting for palm oil-based animal feed in their supply chains or including it in their commitments to be "deforestation-free". Despite millions of tons of palm oil entering global supply chains, major brands like Mondeléz, Nestlé, and Ferrero and dairy companies like Danone, Fonterra, and Lactalis, are not taking adequate action to ensure that the embedded palm oil used to manufacture their milk, cheese, chocolate or ice cream products is not Conflict Palm Oil.

Nearly half of the 14 consumer goods and dairy processing companies assessed publicly state that palm oil-based animal feed and its link to deforestation is an issue but only one, Unilever, discloses an estimate of how much of it enters its supply chains. Of the 14 companies analyzed, only one — Swedish-Danish dairy giant Arla — has made an explicit commitment to ensure palm oil embedded in its milk supply chain is deforestation-free, but the company is not planning to achieve this before 2028. To make matters worse, Danone, Ferrero, Mars, Nestlé, and Unilever are now claiming 100%, or nearly 100%, deforestation-free supply chains — claims which are at best incorrect or at worst misleading as they fail to account for the huge amount of palm oil entering their supply chains through animal feed.

RAN's analysis also found that in 2022, 15 of the 17 companies that imported palm oil products classified as animal feed to the US did not have any NDPE policies, which indicates that these imports are at particularly high risk of being associated with deforestation and human rights abuses. Without such policies it is difficult for dairy farmers who want to use palm oil-based feed products to have any confidence that what they feed to their animals is not contributing to deforestation, the expansion of palm oil into carbon-rich peatlands, and human rights abuses, including the violation of land rights of Indigenous communities opposing palm oil expansion on their lands. The Consumer Goods Forum — the biggest industry forum for manufacturers of consumer-based products — also fails to recommend that its members ensure their NDPE procurement policies apply to embedded palm oil and account for palm oil-based animal feed.

Dairy companies and global consumer goods brands must ensure that palm oil-based animal feed is included in their NDPE policies and deforestation-free commitments without delay and must ensure that their milk suppliers do the same. Companies must account for the volumes of embedded palm oil being used throughout their supply chains and include embedded palm oil in the scope of palm oil and dairy procurement policies. Companies making claims about their deforestation-free status must stop making misleading or inaccurate deforestation-free claims and come clean with the methodologies and data used to make such claims.

Global efforts to end deforestation and human rights abuses for palm oil will fail unless all the companies exposed in this report and the Consumer Goods Forum ensure that NDPE policies are enforced with all suppliers of palm oil products — including suppliers of palm oil-based animal feed in dairy supply chains.

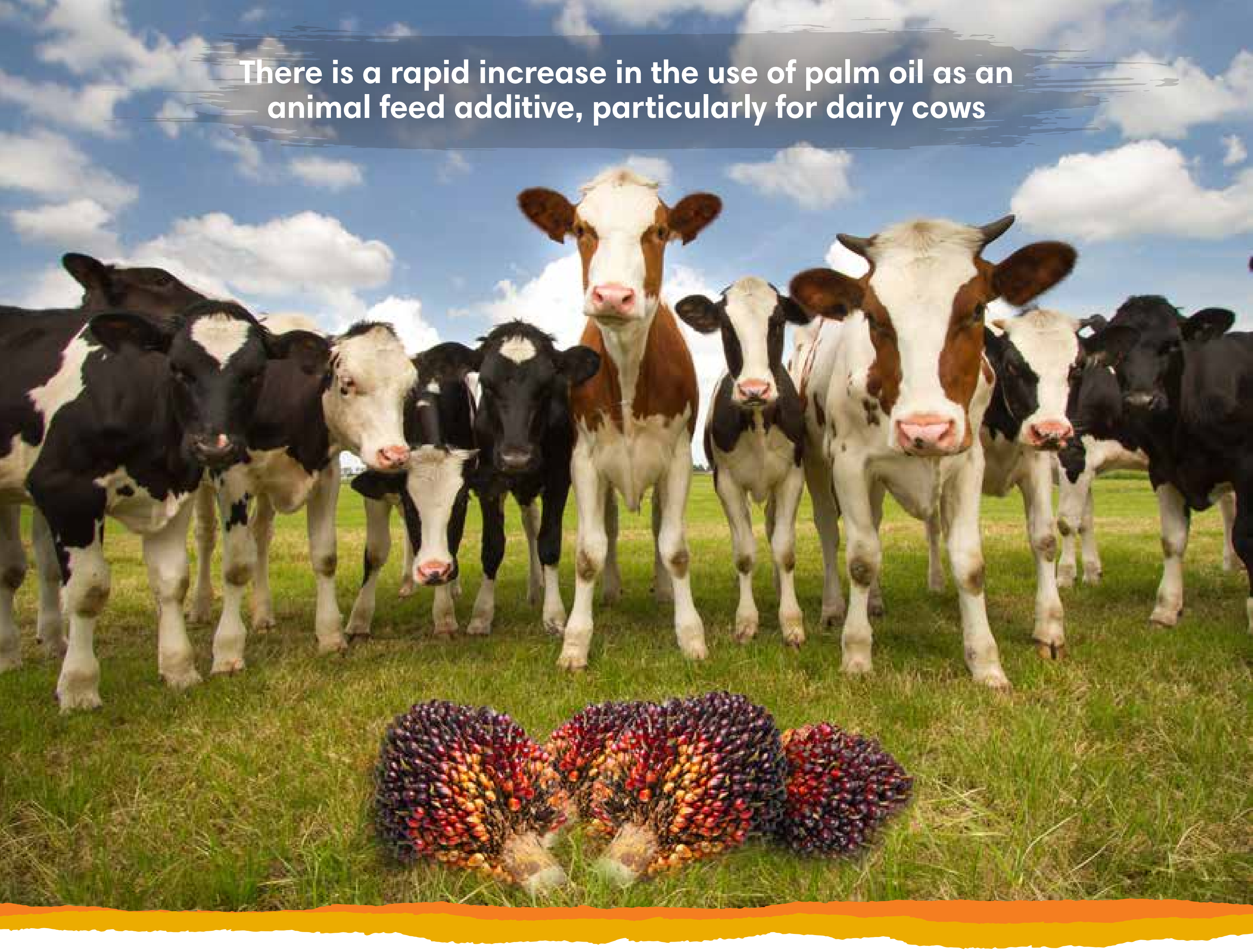
Key findings of the investigation include:

- **Palm oil-based animal feed makes up a massive amount of US palm oil imports.** 36% (nearly two million tons) of all palm oil imports into the US by weight were made up of feed-grade palm oil products, making it the single largest imported palm oil product category in 2022.

- **Companies are excluding millions of tons of palm oil from the accounting of their supply chains and from their NDPE policies.** Thirteen out of 14 of the largest dairy processing and consumer goods companies analyzed do not provide information about how much palm oil-based animal feed is used in their supply chains or include embedded palm oil in the scope of their NDPE policies.

- **A significant percentage of US imports of palm oil-based animal feed are not covered by NDPE policies.** Fifteen of 17 US companies identified as importing palm oil-based animal feed do not have public NDPE policies. They account for 84% of the imports by weight, where importers and exporters could be identified. Fifteen of the 24 identified exporting companies did not have public NDPE policies, accounting for two-thirds of exports to the US by weight, where importers and exporters could be identified.

- **Deforestation-free claims are inaccurate or misleading.** Five of the companies included in the analysis make claims of having achieved deforestation-free supply chains, which are inaccurate or misleading since they do not account for deforestation potentially linked to their suppliers' use of palm oil-based animal feed. RAN estimates that the claims that Nestlé makes to be 96% deforestation-free, for instance, could drop to 72% deforestation-free (of crude palm oil equivalent) if the company accounted for the embedded palm oil in its supply chain.



WHAT IS PALM OIL–BASED ANIMAL FEED?

The use of palm oil has become ubiquitous in ultra-processed food and other consumer goods, but there are also a number of palm oil products used in the feeding of livestock, mostly dairy cows. Palm oil therefore becomes "embedded" in consumer goods products such as milk, cheese, ice cream, and chocolate. The terms embedded palm oil and palm oil-based animal feed are used interchangeably in this report.

Previously, palm oil in animal feed largely came in the form of palm kernel expeller (PKE), a co-product from the crushing of palm kernels, which is used as a bulk feed product. More recently, however, feed additives that are co-products from palm oil refining have been incorporated into dairy cow diets, with the manufacturers of these additives claiming that their use leads to increased milk production, milk fat content, improved milk cow fertility[2,3] and to maintain butterfat levels.[4] These products are often described as "palm fat", "palmitic acid", "rumen-protected fats" or, when fortified with calcium, as "calcium salt" or similar names. While calcium salt can be manufactured from any fatty acids, fatty acids from palm oil have become the most commonly used.[5] The use of such palm oil-based feed products has become widespread, particularly in North America. In some Canadian provinces, reports say that up to 90% of farmers use such feed additives for their dairy herds.[6] No statistics were found for other countries such as the United States.

PHOTO: **Menno Schaefer** / shutterstock

Palm oil-based animal feed is exported mainly from Indonesia and Malaysia to many countries with large dairy herds. An analysis of Indonesian customs data for 2020 and 2021 has shown exports of calcium salt to nearly 30 countries, including the US, a number of members of the European Union, Japan, Australia, New Zealand, and South Africa, as well as countries in the Middle East and South America.[7]

Some industry actors claim that palm oil-based feed additives are solely manufactured from a product of the palm oil refining process called Palm Fatty Acid Distillate (PFAD) and that it is a waste product with no direct impact on land use.[8] There has been significant debate about whether PFAD is considered to be a residue, by-product, or co-product of the palm oil refining process[9,10] but given that the demand for PFAD increasingly exceeds its production[11] — and that it is not only used in animal feed but also in the production of biofuels, soaps, candles, and other products[12] — it is clear that it has become an integral component of the global palm oil value chain. Particularly considering it typically sells at 80% of the price of palm oil itself.[13] The increasing unmet demand for PFAD raises the risk that its production will inherit the deforestation and peat loss problems of virgin palm oil consumption.[14] In addition to PFAD, stearin, a palm oil co-product from the palm oil refining process, is also used as animal feed.[15] In addition to its use in animal feed, stearin is also widely used in the food industry including in margarine and bakery shortening.[16]

The use of palm oil in dairy feed has increased markedly over the last five years, particularly in North America and consumers have started to notice. In the autumn of 2020 in Canada, consumers took to social media to report that, in their experience, Canadian butter had become harder and was not melting as easily anymore. In addition, there were questions on the quality and consistency of butter during the baking process. In early 2021, it was first reported in mainstream media that the reason could be found in changes in the diet of dairy cows, particularly the use of palm-based feed additives, which may have altered the fatty acid profile of cows' milk.[17] This became known as "Buttergate".

Canadian milk producers and industry groups dismissed any claims of a connection between feeding cattle palm oil additives and the hardness of butter. With increased exposure of the issue in national and international media, the main Canadian lobby group representing dairy farmers — Dairy Farmers of Canada (DFC) — first released a memo to its members in which it acknowledged anecdotal reports about the hardness of butter but did not address the issue of palm oil-based feed directly.[18] In a later investigative media report that made the link between palm oil and feed supplements, the Quebec Dairy Industrial Council (CILQ) was more direct, and stated that there was "no scientific evidence that the use of palm oil by producers [has] effects on the quality and functionality of our products and even less on the health of consumers".[19] With public pressure continuing and the industry admitting it did not know how much palm oil-based feed was being used, the Quebec Dairy Industrial Council requested that milk producers in Quebec cease using such supplements,[20] while the DFC committed to establishing a working group on the issue,[21] only to clarify a few days later that, "In the interim, DFC is asking dairy farmers to consider alternatives to palm supplements."[22] A study published in 2022 tested more than 80 butter samples throughout Canada and confirmed that higher palmitic acid and oleic acid content increased the melting points of butter.[23] This was confirmed by a second study that tested 41 samples of Canadian butter across the country.[24]

Considering the lack of available data, it is not known how much palm oil has been used in dairy feed before or after the "Buttergate" scandal in Canada. It was, however, reported that 90% of dairy farmers in Alberta were using palm oil-based supplements (though this was reportedly lower in other provinces).[25] US customs data continues to show a number of shipments of palm oil-based animal feed to Canada through 2022.

PHOTO: **Ram Daya /** We Animals Media

THE SCALE OF THE PROBLEM IN THE US

Tracking the global trade of palm oil-based animal feed is difficult because, unlike PKE, there is no dedicated globally accepted trading code (harmonized systems, or HS code) for such products. To overcome this problem, RAN has carried out a detailed analysis of more than 30,000 shipments of palm oil products to the US in 2022 using customs data.[26] The US was chosen since it is one of the few countries where such data is available and is the world's second-largest milk producer.[27] The analysis serves as an example of the extent to which palm oil-based animal feed has come to dominate palm oil imports to the United States in general. The methodology of how this analysis was carried out can be found in the Appendix.

Because animal feeding regimes are usually carried out at the discretion of individual farmers,[28] it could be easy to miss how much palm oil-based animal feed enters the supply chain, but RAN's analysis found that feed-grade palm oil was the single largest palm oil product category imported to the US in 2022 and accounted for more than a third of US palm oil-related imports by weight. This is consistent with reports from US industry insiders, who told investigators that the use of such products has "exploded" in the US in recent years.[29] Twenty-eight percent of US imports of feed grade-palm oil products came from Indonesia, the country with the highest palm oil-related deforestation rates.

Overall in 2022, 55% of palm oil-linked products imported to the US originated in Indonesia, compared to 20% from Malaysia, 9.5% from India, and 5.5% from Spain. Importantly, more than 35% of all imports by weight have been linked to animal feed material, compared to 20% linked to palm oil/olein and 18% to fatty acids (see the methodology for the limitations of this analysis).

Overview of palm oil imports to the US overall and from Indonesia in 2022[30]

Total U.S. Imports		
Product Category	**Tons**	**% of Total**
Palm oil feed material	1,957,255	36.25%
Palm oil / olein	1,090,789	20.20%
Fatty Acid	984,147	18.23%
Salts & Esters	712,193	13.19%
Shortening / Margarine / frying oil	287,450	5.32%
Palm kernel products	285,118	5.28%
Other palm products	50,600	0.94%
PFAD	24,772	0.46%
Mill effluent	6,676	0.12%
Grand Total	**5,398,999**	**100%**

Total U.S. Imports from Indonesia		
Product Category	**Tons**	**% of Total**
Palm oil feed material	855,741	28.60%
Palm oil / olein	845,825	28.27%
Fatty Acid	496,551	16.59%
Salts & Esters	347,860	11.62%
Shortening/Margarine / frying oil	233,568	7.81%
Palm kernel products	163,006	5.45%
PFAD	23,167	0.77%
Other palm products	21,704	0.73%
Mill effluent	5,000	0.17%
Grand Total	**2,992,425**	**100%**

Feed grade palm oil is the single largest palm oil product category imported to the U.S. in 2022 and accounted for more than a third of U.S. palm oil related imports by weight.

PHOTO: Nanang Sujana

EMBEDDED PALM OIL HIDDEN IN GLOBAL SUPPLY CHAINS

As more companies adopt the leading sourcing standard, known as a No Deforestation, No Peatland, No Exploitation (NDPE) policy, either for a specific commodity or — in the case of fewer companies — across all forest-risk commodities in a supply chain, company claims of having "deforestation-free" supply chains are on the rise. An NDPE policy on paper is only as good as the scope of its application and its implementation throughout supply chains to the forest frontlines where commodities are produced. In many cases, companies are coming up short. In its 2023 annual scorecard, RAN's analysis showed that across ten leading consumer goods companies, only three companies had NDPE policies that applied to all their forest-risk commodity supply chains, and all ten companies analyzed in the 2023 scorecard lacked sufficient implementation to be able to claim deforestation-free supply chains.[31]

The palm oil supply chain is notoriously hard to track, made up of many co-products and middlemen. Palm oil producers, processors, traders, importers, and the consumer goods brands purchasing palm oil products all have a role to play in either making the supply chain more transparent and traceable, or more obscure. If, at any point along the supply chain, the origin of a palm oil product is either not known, known and linked to deforestation or social conflict, or not covered by an NDPE policy, that product becomes Conflict Palm Oil and must not enter the global supply chain. A major challenge in cutting Conflict Palm Oil from global supply chains is that the biggest traders of palm oil refuse to disclose information on the origin of many of the palm oil-based feed products on the market today. As a result, palm oil products are at risk of contributing to deforestation and social conflict, especially those palm oil-based feed products that are not demonstrably covered by NDPE policies and their implementation.

It is therefore even more concerning that palm oil-based animal feed is largely unaccounted for in companies' monitoring, verification, and reporting efforts. There is no doubt that embedded palm oil should fall within the scope of NDPE policies where best practice stipulates that all third-party suppliers of products that contain palm oil should be included. Moreover, a number of companies are already including soy-based animal feed in their reporting.[32] Similarly, the Consumer Goods Forum — the leading industry network of over 400 consumer goods companies — includes soy-based animal feed in its soy roadmap but does not do so for palm oil (see below).

Without the adoption and implementation of NDPE policies by all producers, exporters, and importers along the supply chain of palm oil-based animal feed products, dairy companies, and global consumer goods brands are at very high risk of sourcing products that have been produced using palm oil-based feed originating from Conflict Palm Oil. In addition, downstream actors that use large amounts of dairy products may be making misleading statements about their promises to be deforestation-free if they lack adequate methods to account for the impact of the palm oil-based animal feed used in their supply chains.

In an effort to understand the extent of the embedded palm oil problem, RAN undertook an assessment of the published policies of over 50 companies that are amongst the most exposed to the trade, manufacturing, or use of palm oil-based animal feed products. The companies assessed are divided into the following three groups based on their position in palm oil-based animal feed supply chains:

The three groups of companies were:

- **Major dairy and consumer goods companies:** This group of 14 companies consists of the world's ten largest dairy companies[33] as well as those most exposed to palm oil-based dairy feed amongst the group of consumer goods companies profiled in RAN's annual scorecard.[34] These major companies own some of the world's largest dairy and chocolate brands.

- **Malaysian and Indonesian exporters**: This group of 24 companies consists of the exporters of palm oil products identified in the US import analysis conducted by RAN. Most of these companies also export palm oil products to other regions in the world.

- **US importing companies**: This group of 17 companies consists of the importers of palm oil-based animal feed products identified to be importing to the US in the import analysis conducted by RAN. These US companies distribute the palm oil-based animal feed that ultimately ends up on dairy farms and embedded in dairy products.

THE MAJOR DAIRY AND CONSUMER GOODS COMPANIES FEEDING THE DEMAND

RAN analyzed the published policies of 14 of the world's largest dairy and consumer goods companies to determine whether or not they have adequate policies in place to ensure that the palm oil-based animal feed used in their supply chains is produced in accordance with the best practice of No Deforestation, No Peatland, and No Exploitation (NDPE) benchmark. These companies are driving the demand for palm oil-based animal feed through their manufacturing of dairy, chocolate, and other processed food products.

These companies are: Arla, Dairy Farmers of America, Danone, Ferrero, Frontera, FrieslandCampina, Lactalis, Mars, Mengniu, Mondeléz, Nestlé, Saputo, Unilever and Yili.

The analysis was undertaken using the methodology described in the Appendix of this report and our findings are summarized below.

NDPE policies do not include palm oil-based animal feed

We found that only one of the 14 companies assessed had an NDPE policy that explicitly states that it applies to palm oil-based feed used in its milk supply chain. While only one company includes palm oil-based animal feed in its commitment, three companies lacked any published palm oil policy at all. The remaining 10 companies have an NDPE policy that says the company will not source palm oil that has been linked to deforestation, peatland degradation, and human rights abuse, but these policies do not include embedded palm oil as they fail to state that NDPE requirements must be adhered to by dairy suppliers that are using palm oil-based animal feed. This means that these companies are failing to set strict standards on how the palm oil-based animal feed used in their supply chain is produced.

Danish-Swedish dairy giant Arla, which released its new NDPE and palm oil policies in 2023, is the only company assessed that includes palm oil-based animal feed in its milk supply chain in the scope of its NDPE policy. Arla's policy states clearly that it applies to products that contain palm products that Arla purchases directly, as well as indirect palm embedded in feed used by farmers that supply Arla.[35] This covers all entities, operations, and geographies under the company's management control. Disappointingly, Arla does not plan to implement its embedded palm oil commitment until 2028 while the rest of the company's sourced palm oil aims to be deforestation and conversion-free by the end of 2025.[36] The late implementation plans of the policy are of particular concern considering that under the recently passed EU Deforestation Regulation (EUDR), products that contain palm oil will have to be proven deforestation-free by the beginning of 2025 and this will likely apply to the imported palm oil-based animal feed. While Arla is likely not the importer of this feed used by farmers and therefore not responsible for ensuring their compliance, the companies that place the products on the market will nevertheless have to comply with the legislation which could result in earlier compliance by Arla.

The remaining 10 companies have NDPE policies, but because these policies do not apply to embedded palm oil, they fail to ensure that the vast amount of palm oil-based animal feed that enters their direct and indirect supply chains is free of links to deforestation and human rights abuses. This group of companies includes major consumer goods companies such as Ferrero,[37] Nestlé,[38] Mars,[39] Mondeléz,[40] and Unilever,[41] as well as some of the world's largest dairy processing and manufacturing companies including Danone,[42] Fonterra,[43] FrieslandCampina,[44] Lactalis,[45] and Mengniu.[46]

Of the three companies with no discernible NDPE policy at all, two are located in North America, US-based Dairy Farmers of America and Canadian-headquartered Saputo. Their lack of NDPE policies, let alone a policy on palm oil-based animal feed is of particular concern considering that the US and Canada are likely the largest users of palm oil-based feed additives. The only other company with no overall NDPE policy is China's Yili.

Inadequate deforestation cut-off dates

RAN reviewed the published policies to determine if they aligned with the best practice deforestation and peatland development cut-off date of December 31, 2015. This is the date after which palm oil production must not occur on lands that have been cleared of forests, or on peatlands that have been degraded.

We found that of the 11 companies that have adopted policies to not source Conflict Palm Oil, seven (Danone,[47] Ferrero,[48] FrieslandCampina,[49] Mars,[50] Mengniu,[51] Nestlé,[52] and Unilever[53]) say they adhere to a cut of date of December 31, 2015 or earlier.

Arla[54] and Mondeléz[55] have adopted a cut-off date of December 31, 2020, though Arla[56] has earlier cut-off dates for some volumes of palm oil such as RSPO certified products, while Fonterra and Lactalis have not published any cut-off dates despite having adopted NDPE policies. The adoption of cut-off dates later than what is considered best practice and the lack of any cut-off dates strongly undermines the NDPE policies of these companies.

Lack of public recognition of the problem

RAN also reviewed public reports issued by the companies to assess if each company publicly recognizes the deforestation risk associated with palm oil-based animal feed. Seven of the 14 companies recognize and admit publicly that there are deforestation risks associated with palm oil-based animal feed — including Arla,[57] Danone,[58] Ferrero,[59] FrieslandCampina,[60] Mondeléz,[61] Saputo,[62] and Unilever.[63] The rest of the companies analyzed have failed to even issue public statements that show they recognize the potential impacts of the use of palm oil-based animal feed in their supply chains.

Failure to account for the impact of palm oil-based animal feed on forests

Another concerning fact is that the impact of embedded palm oil is largely being unaccounted for in companies' public disclosure, monitoring, verification, and reporting efforts. Despite the high level of disclosure by the consumer goods companies of other palm oil ingredients including sourcing volumes and information about suppliers, when it comes to embedded palm oil, this is not the case. Considering that many companies included in this analysis are supplied by a very large number of dairy farms, developing methodologies to account for embedded palm oil is a challenging but necessary task to ensure dairy products are free of Conflict Palm Oil.

The only company that has published figures in regards to its exposure to embedded palm oil through its supply chain is Unilever, which hired a consultancy to develop its calculations. Unilever claims to have consumed 30,000 tonnes of palm oil via its embedded palm oil in its dairy supply chain in 2022, which is approximately 3% of its overall palm oil consumption.[64] However, there is no information provided on the methodology used or the underlying assumption to carry out the calculations. None of the other companies included in this analysis provide figures to quantify the use of palm oil-based animal feed in their supply chains. We also identified two examples of companies that indicate they are actively looking at this issue. One is French-owned Lactalis, the world's largest dairy company, and the other is Ferrero, one of the world's largest chocolate companies.

Lactalis says that it has set itself a target, "in 8 pilot countries, for 100% of its direct volumes of raw cow's milk to be subject to an on-farm assessment based on the volumes and origin of palm and soybeans (and their derivatives) used in animal feed by 2025 (2026 for Brazil). This represents a coverage rate of 45% of the total annual volume of raw milk collected by the Lactalis Group."[65] There is, however, little detail in regards to this pilot and Lactalis has not clearly stated that all animal feed across its supply chain will be covered by the company's NPDE policy.[66]

Ferrero says in its dairy charter that it "commits to work with our strategic suppliers to map the usage, and associated deforestation or conversion risk, of the soy and palm oil used for animal feed in our dairy supply chain, followed by the identification of potential levers that can be activated to progressively reduce this risk."[67] Yet, with no existing timeline, disclosure, or a clear commitment to include palm oil-based animal feed in the company's NDPE policy,[68] such vague statements are insufficient, especially considering that there has not been any update since the publication of Ferrero's dairy charter in December 2022.[69]

Deforestation-free claims of global brands can't be trusted

Major dairy and consumer goods companies — the buyers of much of the palm oil from Indonesia and Malaysia that is traded globally — have responded to pressure from consumers on their role in driving deforestation by adopting NDPE policies and are beginning to champion themselves and their products as "deforestation-free". Nestlé, Unilever, Danone, Ferrero, and Mars are all making public claims about their deforestation-free status. Without accounting for the impact that the palm oil used in the animal feed of their milk suppliers has on forests, such claims can be incorrect at best and misleading at worst.

Nestlé claimed 96.0% of its "primary supply chain" of palm oil was deforestation-free in 2023.[70] When we assessed this claim, we found no reference to embedded palm oil having been included in the company's claim. In an effort to understand the potential impact of accounting for palm oil-based animal feed on Nestlé's deforestation-free claim, RAN undertook an evaluation based on the disclosure of the volume of milk it uses each year, the palm oil it procures annually and industry figures on the amount of palm oil needed to produce the palm oil derived products used to make animal feed.

Nestlé reports on using the equivalent of around 12 million tons of fresh milk equivalent per year consisting of 7 million tons of direct purchases of fresh milk and 5 million tons of dairy ingredients such as milk powder[71] and that it takes about 10 tons of crude palm oil to produce a ton of crude palm kernel oil.[72] The palm oil industry claims that it also takes 27 tons of crude palm oil to produce 1 ton of PFAD — the key product that is used to manufacture animal feed as often claimed by the industry.[73] This means that assuming that 10% of the milk used by Nestlé might originate from cows that are fed on palm oil-based feed products, Nestlé's crude palm oil equivalent usage of 1.7 million tons in 2022 would increase to more than 2.2 million tons if the company accounted for the volume of palm oil used to manufacture animal-feed products in its supply chain. Using these figures in our calculation, RAN estimates that Nestlé's claim of a 96% deforestation-free palm oil supply chain could fall to about 72% as crude palm oil equivalent if 10% of the milk the company sources was linked to palm oil-based animal feed. See the Appendix for the methodology used to develop this calculation.

When asked to comment on this finding, Nestlé stated that its supply chain disclosure for milk provides a lower figure of 5.5 million tons of fresh milk per year, but did not provide additional information about its total milk use (fresh milk and milk ingredients). Nestlé also stated it considered our figures and assumptions to be incorrect, but did not provide details about its concerns.

Unilever[74] earned the best mark in RAN's 2023 brand scorecard due to its adoption of a cross-commodity NDPE policy. The company recently claimed that the palm oil it sources is 97.1% deforestation-free but says this is limited to palm oil and palm kernel oil. The policy specifically excludes "palm fatty acid distillates (PFAD), which are a by-product of the refining process, and tail ingredients used in our products"[75] even though their NDPE policy scope includes PFAD, but not for its use in animal feed.[76] The company recently disclosed the methodology[77] it uses to make deforestation-free claims and to independently verify its suppliers' compliance with its NDPE policy.

The European Deforestation Regulation and palm oil-based animal feed

In June 2023 the EU published regulation 2023/115, also known as the EU Deforestation Regulation (EUDR) which requires companies trading in cattle, cocoa, coffee, oil palm, rubber, soya, and wood — as well as products derived from these commodities — to conduct extensive diligence on the value chain to ensure the goods do not result from recent deforestation. The products covered by the legislation are based on trading codes (HS codes) and listed in Appendix I of the regulation. The likely codes included in the EUDR under which palm oil-based feed products are traded are 291570, 291590, 382311, 382312, and 382319. A ruling by US authorities for some palm oil-based animal feed products provided a classification of two different HS codes,[78] both of which (382319 and 291570) are included in the EUDR's Appendix.[79] The EUDR requires that importing companies ensure that the products they place on the EU market are not linked to deforestation. To do this companies have to be able to trace products all the way back to the production units and ensure no deforestation has taken place there after December 31, 2020. Penalties for operators who place products on the market that are linked to deforestation can reach up to 4% of the company's turnover in the EU as well as product confiscations and temporary bans on trading relevant commodities.[80]

Given the lack of NDPE policies of many of the players involved in the embedded palm oil sector, in particular Indonesian exporters (some of which are also known to supply Europe), and the lack of known traceability systems put in place for palm oil-based animal feed, this research suggests that it is unlikely that European importers would currently be able to guarantee the deforestation-free status of their animal feed imports.

The EUDR is of particular concern to the companies in this report that have NDPE policies and source milk or dairy products in Europe. Arla,[81] Danone,[82] Ferrero,[83] FrieslandCampina,[84] and Lactalis[85] are headquartered in Europe and source much of their milk from there. Nestle[86] and Unilever,[87] while headquartered in European non-EU member states, have significant operations within the EU that process dairy products. Fonterra,[88] Mars,[89] Mondeléz,[90] and Yili[91,92] all have milk processing facilities or manufacturing plants using dairy-based ingredients within the EU.

Danone claims that 91% of its supply chain is deforestation-free.[93] The company also purchases around 5.1 million tons of milk directly (there may be additional indirect purchases not reported). If 10% of Danone's supplying milk herd would be fed with palm oil-based feed additives, this could mean more than 500,000 tons of crude palm oil equivalent could enter Danone's supply chain without being guaranteed to be covered by NDPE policies. Danone currently reports the use of around 70,000 tons of palm oil products (however when translated to crude palm oil equivalent this figure would be much higher). Danone has failed to disclose the methodology it uses to make deforestation-free claims.

Ferrero is one of two chocolate companies included in the analysis that makes claims about their no-deforestation status when it comes to palm oil. According to the company's disclosure, 97.7% of its palm oil is deforestation-free.[94] However, in its progress report palm oil-based feed and embedded palm oil are not mentioned, and there is no detail as to its exclusion. With Ferrero claiming in 2021 that it "analyzed all of [its] supply chain excluding acquisitions"[95] such statements could be considered misleading. Ferrero has failed to disclose the methodology it uses to make deforestation-free claims and continues to rely on second-party, not independent third-party, verification of these claims.

Mars is the other chocolate company that has made no deforestation claims by stating it "has delivered a deforestation-free palm oil supply chain".[96] With no reference to embedded palm oil, let alone relevant disclosure that indicates its use in the Mars supply chain, such sweeping statements are potentially misleading and create an unjustified image of the company delivering on promises of a deforestation-free supply chain. Mars has failed to disclose the methodology it uses to make deforestation-free claims and continues to rely on second-party, not independent third-party, verification of these claims.

	Company has a published NDPE policy to exclude Conflict Palm Oil from its own operations and/or global supply chains	Company's NDPE policy requirements explicitly apply to palm oil-based animal feed throughout its supply chains	Deforestation and peatland degradation cut-off date	Company publicly reports on embedded palm and volumes of palm oil-based animal feed used in global supply chains	Company publicly recognizes the need to address the risks of sourcing Conflict Palm Oil via embedded palm in its global supply chains	Deforestation-free palm oil supply chain claims	Company includes all embedded palm in deforestation-free claims
ARLA	YES[97]	YES[98]	December 31, 2020[99]	NO	YES[100]	No claims found	N / A
Dairy Farms of America	NO	NO	NO	NO	NO	No claims found	N / A
Danone	YES[101]	NO	December 2015[102]	NO	YES[103]	91% deforestation and conversion free palm oil[104]	NO
Ferrero	YES[105]	NO	December 31, 2020[106]	NO	YES[107]	97.7% deforestation-free palm oil supply chain[108]	NO
Fonterra	YES[109]	NO	No cut-off date found[110]	NO	NO[111]	No claims found	N / A
FrieslandCampina	YES[112]	NO	November 30, 2009[113]	NO	YES[114]	No claims found	N / A
Lactalis	YES[115]	NO	No cut-off date found	NO	NO	No claims found	N / A
Mars	YES[116]	NO	December 31, 2015[117]	NO	NO	100% deforestation-free palm oil supply chain[118]	NO
Mengniu	YES[119]	NO	December 31, 2015[120]	NO	NO	No claims found	N / A
Mondelez	YES[121]	NO	December 31, 2020[122]	NO	YES[123]	No claims found	N / A
Nestlé	YES[124]	NO	December 31, 2015[125]	NO	NO	96.0% palm oil deforestation-free[126]	NO
Saputo	NO[127]	NO	N / A	NO	YES[128]	No claims found	N / A
Unilever	YES[129]	NO	December 31, 2015[130]	YES[131]	YES[132]	97.1%[133]	NO
Yili	NO	NO	N / A	NO	NO	No claims found	N / A

* Arla includes it in its policy but delays the inclusion of feed by two years compared to other palm oil products.

** Unilever engaged a consultant to estimate its embedded palm consumption but does not provide any details about the methodology and assumption used.

INDONESIA AND MALAYSIAN EXPORTERS OF PALM OIL-BASED ANIMAL FEED

In the palm oil supply chain, exporters play a crucial role in getting palm oil products out to the global market. It is often difficult to identify these companies, however, let alone determine whether or not they have adequate No Deforestation, No Peatland, and No Exploitation (NDPE) policies in place.

In RAN's analysis of customs data, it was not possible to identify roughly a quarter of the exporter companies that are exporting palm oil-based animal feed products from Indonesia and Malaysia to the US as they were listed as unknown or only the logistics company organizing the transport of the products were listed. Of the shipments where a company can be identified, an estimated two-thirds of the feed-grade palm oil products entering the United States in 2022 were not covered by public NDPE policies.

The two largest exporters from Indonesia and Malaysia — Jati Perkasa Nusantara and Nutrion International — account for nearly a third of the total exports of palm oil products, neither of which have an NDPE policy in place. Adopting NDPE policies is a needed first step in ensuring the end of the Conflict Palm Oil trade.

Nine exporters have published NDPE policies in place but are failing to adequately report on the implementation of these policies. Without rigorous implementation including disclosure of the methods used and the results from monitoring and independent verification systems, such policies often fall short. A number of these exporters refer to disclosure via an initiative called the NDPE Implementation Reporting Framework which is based on self-reported claims of compliance, not truly independent verification of the fulfillment of NDPE policies.

It is important to note that RAN's analysis focused on US customs data, as it was the most complete data available, which naturally identified exporters of palm oil-based animal feed to the US specifically. However, these exporters are likely the same companies that are also exporting to other countries, including to the EU. Indeed, an analysis of older Indonesian export data (Oct. 2019 - Sept. 2021) carried out by RAN shows a high degree of overlap. Given the lack of NDPE policies of many if not most of these exporters, and the lack of known traceability and independent verification systems put in place for palm oil-based animal feed, this research suggests that it is unlikely that European importers would currently be able to guarantee the deforestation-free status of their animal feed imports and would run afoul of the EU Deforestation Regulation (EUDR).

Exporter	Tons	% of Total	NDPE Policy	Deforestation and peatland conversion cut- off date
Jati Perkasa Nusantara	303,528	15.45%	NO	NO
Nutrion International	298,315	15.18%	NO	NO
Wilmar International	274,052	13.95%	YES[134]	December 31, 2015[135]
Logistics Company*	272,946	13.89%	N / A	N / A
Unknown*	219,561	11.18%	N / A	N / A
Budi Feed	143,048	7.28%	NO	NO

* See methodology in the Appendix

Nutracor AG / Wawasan Agrolipids	92,678	4.72%	YES[136]	December 15, 2018[137]
Evyap-Oleo	61,106	3.11%	NO	NO
Cisadane Raya Chemicals	57,801	2.94%	NO	NO
Permata Hijau Group	45,223	2.30%	YES[138]	December 15, 2015[139]
Musim Mas	44,338	2.26%	YES[140]	December 15, 2015[141]
Sheel Oil & Fats Private Ltd	42,608	2.17%	NO	NO
Ecolex SDN BHD	26,350	1.34%	NO	NO
Dua Kuda Indonesia	19,400	0.99%	NO	NO
Pacific Oleochemicals SDN BHD	16,356	0.83%	NO	NO
IOI Group	15,187	0.77%	YES[142]	Not Found
Bakrie Group	6,388	0.33%	YES[143]	Not Found
Sinar Mas Group/ Golden Agri Resources	5,635	0.29%	YES[144]	Not Found
Britz Specialities Sbd Bhd	5,634	0.29%	NO	NO
3F Industries	4,104	0.21%	YES[145]	Not Found
Royal Foods Indonesia/KPN	3,376	0.17%	NO	NO
Global Agri Resources	3,138	0.16%	NO	NO
Green Natural Industries SDN	1,378	0.07%	NO	NO
Southern Acids Berhad	1,355	0.07%	NO	NO
Vito Lipids	1,100	0.06%	NO	NO
Sintong Abadi	50	0.00%	YES[146]	Not Found
GRAND TOTAL	**1,964,654**	**100%**		

U.S. IMPORTERS OF PALM OIL-BASED ANIMAL FEED

Another important middleman in the palm oil supply chain, importers bring the palm oil products exported from Indonesia and Malaysia to the domestic markets where dairy products are being produced. Similarly to exporters, it is often hard to identify these companies. In RAN's analysis of the US import data from 2022, roughly a quarter of the imports could not be traced to a named importing company, or only the names of the logistics companies involved in the trade were listed.

RAN's analysis revealed 17 identifiable importers of feed-grade palm oil products to the US, with the vast majority of feed-grade palm oil products coming into the country with no guarantee of being deforestation-free or produced in accordance with NDPE requirements. Of the 17 importers, only two had published NDPE policies at the time of writing. The two largest companies by far — Nutrition Feeds and Global Agri Trade — accounted for 57% of the total amount of imports and neither have NDPE commitments in place. Wilmar, the world's largest palm oil trader, and Perdue Agribusiness were the two identifiable importing companies that have NDPE policies in place but together they accounted for only 12% of the total. Overall where the names of the importers were known (see methodology appendix), 84% of the volume of palm oil-based animal feed products imported to the US in 2022 was not covered by a published NDPE policy.

Importer	Tons	% of Total	NPDE Policy	Deforestation and peatland conversion cut- off date
Nutrion Feeds	709,913	36.13%	NO	NO
Global Agri Trade	416,937	21.22%	NO	NO
Logistics Company*	286,602	14.59%	N / A	N / A
Unknown*	217,724	11.08%	N / A	N / A
Wilmar International	151,846	7.73%	YES[147]	December 31, 2015[148]
Perdue Agribusiness LLC	79,760	4.06%	YES[149]	December 31, 2015 (deforestation) November 2018 (peatland conversion)[150]
Darby Trading Inc	51,762	2.63%	NO	NO
Global Nutritional Corporation	20,585	1.05%	NO	NO
Energy Feeds International	7,306	0.37%	NO	NO
Valudor Products LLC	6,254	0.32%	NO	NO

PHOTO: **Wayne Hutchinson /** Alamy Stock Photo

Nature Trading Group	3,621	0.18%	NO	NO
Royal Star Food Corporation	3,376	0.17%	NO	NO
The Scoular Company	2,518	0.13%	NO	NO
Berg + Schmidt	2,368	0.12%	NO	NO
Rierden Chemical & Trading Company	1,378	0.07%	NO	NO
Silver Maple Equipment LLC	963	0.05%	NO	NO
WLT Distributors	940	0.05%	NO	NO
Jefo USA	406	0.02%	NO	NO
Poulin Grain Inc	397	0.02%	NO	NO
GRAND TOTAL	1,964,654	100%		

THE ROLE OF THE CONSUMER GOODS FORUM

The failure to adequately address the role of palm oil-based animal feed as a driver of deforestation is not limited to the group of consumer goods manufacturing companies assessed in this report. This is an industry-wide problem that needs an industry-wide solution. One of the bodies that could implement industry-wide solutions is the Consumer Goods Forum.

The Consumer Goods Forum (CGF) is an industry forum for CEOs and senior managers of some 400 retailers and manufacturers of consumer-based products.[151] Its members span across 70 countries and earn EUR 4.6 trillion through sales of products that are manufactured using forest-risk commodities, including palm oil.[152] Danone, Ferrero, FrieslandCampina, Nestlé, Mars, Mengniu, Mondeléz and Unilever are members.

The CGF is well-known for passing a commitment in 2010 for all its members to achieve zero net deforestation by 2020 for key forest-risk commodities including palm oil, soy, beef and pulp/paper.[153,154] The organization and its members failed to achieve this goal and subsequently, the CGF launched a new Forest Positive Coalition in 2020 which aims to leverage the collective influence of 22 of its members to drive and accelerate efforts to eliminate deforestation from the supply chain of each individual member and across their suppliers' entire supply base.[155] The Coalition currently has only 22 members (less than 10% of all retailer and manufacturer members of the CGF) including Danone, Nestlé, Mars, Mondeléz, and Unilever.

The Forest Positive Coalition has begun issuing sector-specific roadmaps and reporting on progress for key commodities — palm oil, soy, beef, pulp/paper, and fiber-based packaging.[156] The group defines Forest Positive as a holistic vision for sustainable economic development, improved livelihoods, and climate positive outcomes.[157] Its theory of change focuses on sourcing deforestation and conversion-free volumes in supply chains, supporting suppliers to do the same, and working towards broader transformation of commodity production landscapes into forest positive areas.[158]

The CGF's Forest Positive Coalition's Palm Oil Roadmap is a document that sets the expectations for how its members should implement NDPE policy commitments and "Forest Positive" Goals in the palm oil sector. It sets out a number of Key Performance

Indicators for annual reporting, including a KPI on the percentage of palm oil volumes that are Forest Positive — aka deforestation-free.[159] However, the CGF's methodology for calculating "Palm Oil Deforestation and Conversion Free" volumes does not state the need to ensure volumes include the volume of palm oil used in animal feed.[160] This is in contrast to the methodology for soy, which details the types of "embedded soy" products that need to be included — such as soy used in feed mix for animal products and soy embedded in meat, dairy, and eggs used in processed foods.[161] In its most recent annual report, the Forest Positive Coalition referred to the additional complexities posed by embedded soy especially in regards to traceability challenges.[162] The report also cites challenges with palm oil derivatives but remained silent on the issue of embedded palm oil.[163]

In the last year, a number of CGF members have issued progress reports on activities they have taken against the key performance indicators outlined in the palm oil roadmap. The reports published for Danone,[164] Mars,[165] Mondeléz,[166] Nestlé,[167] and Unilever[168] all fail to recognize embedded palm oil as an ingredient that is a material commodity. Ferrero, FrieslandCampina, and Mengniu have not reported as they are not a member of the Forest Positive Coalition. It is clear from reviewing the CGF's Forest Positive Coalition's Palm Oil Roadmap and these reports that the CGF is failing to ensure its members address embedded palm oil in dairy supply chains, and account for palm oil-based animal feed when assessing their production 'footprint' in its "Forest Positive Approach".

Global efforts to end deforestation for palm oil will fail unless the Consumer Goods Forum ensures No Deforestation, No Peatland, and No Exploitation (NDPE) policies are enforced with all suppliers of palm oil products — including suppliers of palm oil-based animal feed in dairy supply chains. The CGF must ensure its methodology for calculating "Palm Oil Deforestation and Conversion Free" volumes does not result in misleading deforestation-free claims by its members and the Forest Positive Coalition. It must require its members to include embedded palm oil as a material commodity for annual reporting and in deforestation-free assessments and claims.

PHOTO: Paul Hilton / RAN

CONCLUSION

Amidst a growing climate and biodiversity crisis, and with a too-long history of deforestation and human rights abuses, it is crucial that Conflict Palm Oil be kept out of production and global supply chains. Transparent and adequately tracked supply chains are what's required of the industry, made only more necessary by the increase of global regulation and companies' own commitments to do so. Which is why the finding that millions of tons of palm oil imports into the US are made up of unaccounted palm oil-based animal feed products is all the more concerning.

Rainforest Action Network's campaigns call on some of the most influential brands fueling the destruction of rainforests and the violation of human rights to take real action for forests and communities. This report examined more than 30,000 shipments entering the United States in 2022 — the country and year for which the most complete data is available — and found that palm oil-based animal feed is now the single largest palm oil product category imported to the United States. This research also revealed that the world's ten largest dairy processing companies and many global consumer goods companies are not currently accounting for palm oil-based animal feed in their supply chains or including it in their commitments to be deforestation-free. Despite millions of tons of palm oil entering global supply chains, major brands like Mondeléz, Nestlé, Mars, and Ferrero — and dairy companies like Danone, Fonterra and Lactalis — are not taking adequate action to ensure that the embedded palm oil used to manufacture their milk, cheese, chocolate or ice cream products has been produced responsibly. This means that many of the deforestation-free claims made by companies are inaccurate or misleading.

Major consumer goods brands and the dairy companies providing them with milk products must first adopt No Deforestation, No Peatland, and No Exploitation (NDPE) policies that apply to embedded palm oil in their supply chains. The wider 400 companies in the Consumer Goods Forum, and exporters and importers of palm oil-based animal feed, must also follow suit.

All of the brands profiled in this report have set goals for ending deforestation across their forest-risk commodity, or palm oil, supply chains. However brands are failing to publish the methods used to make deforestation-free claims and are not including palm oil based-animal feed in their assessments. Now, with the problem exposed, any company that continues to make deforestation-free supply chain claims without taking steps to account for embedded palm oil runs the risk of lying to consumers and other stakeholders. Brands need to increase transparency by publishing supply chain disclosures across all their forest-risk commodities, including embedded palm.

Brands must take real action to prevent further human rights violations and deforestation. We call on them to Keep Forest Standing and Uphold Indigenous Peoples Rights now. The 400 companies in the Consumer Goods Forum, and the agribusiness sector at large, must do the same.

PHOTOS: Nanang Sujana; Paul Hilton / RAN

APPENDIX

7.1 Methodology for assessment of company policies and published statements

The table below presents the metrics used to assess the published policies and/or disclosure made by each of these companies regarding palm oil-based animal feed. All six indicators were used in the assessment of major dairy and consumer goods companies. The first two indicators were used in the assessment for Malaysian and Indonesian exporters and US importing companies.

All analysis relied on self published information by the companies assessed, usually documents that were obtained from their websites, or referred to in their published sustainability reports or statements. Only information authored by the companies assessed was considered. A due hearing process was held with all companies that included a questionnaire and opportunity to comment on the findings of our policy assessment. The responses received were considered in our assessment.

Assessment Indicator	Metrics for YES	Metrics for NO
Company has a published NDPE policy to exclude Conflict Palm Oil from its own operations and/or global supply chains.	Published policies require production, processing and procurement of palm oil that complies with core elements of a palm oil No Deforestation, No Peatland and No Exploitation (NDPE) policy. This includes No Deforestation of High Conservation Value areas and High Carbon Stock forests and No degradation of peatlands, regardless of depth, and No Exploitation of Indigenous Peoples, local communities and workers.	No published policy that requires palm oil production, processing or procurement that complies with core elements of a NDPE policy.
Company's NDPE policy requirements explicitly apply to palm oil-based animal feed throughout its supply chains.	The NDPE policy specifically states it applies to all palm oil-based animal feed products in the scope of the policy.	NDPE policy does not state it applies to palm oil-based animal feed in the scope of the policy, or NDPE requirements only apply along parts of its supply chain.
Deforestation and peat land degradation cut-off date.	Policies are consistent with the best practice palm oil sector specific deforestation and peatland degradation cut-off date of no later than December 31, 2015.	No deforestation and peatland degradation cut-off date or date is later than December 31, 2015.
Company publicly reports on embedded palm and volumes of palm oil-based animal feed used in global supply chains.	The company publicly reports on the volume of embedded palm oil in animal feed used along its entire supply chain (including direct and indirect suppliers) via its own publications, or those of other initiatives such as the Consumer Goods Forum Forest Positive Coalition or the CDP.	No reporting on the volumes of embedded palm oil in global supply chains was found on the company's website or via publicly accessible third-party sites.

Assessment Indicator	Metrics for YES	Metrics for NO
Company publicly recognizes the need to address the risks of sourcing Conflict Palm Oil via embedded palm in its global supply chains.	Any published statement in which the company acknowledges the potential exposure to deforestation and human rights abuse via embedded palm oil for animal feed, including contextual statements.	No such statement was found.
Company accounts for the impact of palm oil-based animal feed in its claims on deforestation-free supply chains.	Company has a published methodology that is used to assess the status of Deforestation and conversion within its global supply chains. The company has made deforestation-free claims and disclosed calculations that demonstrate that the claims made include the status of volumes of embedded palm oil used along its entire supply chain (including use of palm oil based animal feed by direct and indirect suppliers manufacturing dairy products).	Company published methodology for deforestation-free claims demonstrates that it does not include embedded palm oil. Or company is making deforestation-free claims but lacks a published methodology. Or company does not make any deforestation-free claims.

7.2 Methodology for analysis of US customs data

RAN nalyzed customs data for more than 30,000 shipments entering the United States in 2022 — the country and year for which the most complete data is available. The following methodology outlines how this analysis was undertaken.

Data Time period: January 1 2022 to December 31, 2022. Initially this amounted to more than 56,000 shipments.

Search terms: ca salt, calcium salt, capric, caprolic, caprylic, fatty acid, feed material, gmp, lauric, linoleic, miristic, myristic, oleic, olein, palm, palmitic, rbd, stearic, PFAD.

Data cleaning and deletion: A number of search terms were used in order to delete shipments that are not linked to palm oil include such as coconut, canola, sunflower garments, gloves, heart of palm etc. Shipments were also checked and further deleted according to unusual shipment weights and unusual countries of origin. If the product was not clearly associated with palm oil and the origin was not linked to palm oil via the port (in Indonesia, Malaysia) or exporting company, shipments have not been included. In addition, shipments that show the addresses of consignees in other countries, in particular Canada, Mexico and Puerto Rico, have also been deleted. After data cleaning approximately 31,500 shipments remained.

For around a quarter of the palm oil-based animal feed products traded, no company names were provided or only the logistics or shipping companies were listed.

Country of origin: The country-of-origin information is often incorrect in US customs data. This was rectified using the (usually accurate) port of origin data.

Classification: The focus was on identifying likely animal feed products. This was done through product descriptions in the data such as feed material, GMP, calcium salt, C16 etc. but also through information about the shipper and consignee of each shipment and known trade names of the products. Non-feed material was harder to classify and largely relied on product description that often overlapped with each other and often there is no clear differentiation between a fatty acid and an ester for instance. While some assumptions have to be made due to the data quality issues, the feed martial classification is considered conservative for instance a significant number of shipments were described as "Palm Fatty Acid Distillate" but these have generally not been classified as feed material unless there was supporting information even though much of this may end up being used in animal feed.

Classifications include:

- Palm oil feed material
- Palm oil / olein
- Fatty Acid
- Salts & Esters
- Shortening / Margarine / frying oil
- Palm kernel products
- Other palm products
- PFAD
- Mill effluent

7.3 Methodology for estimating potential variation to Nestlé's deforestation-free claim

Given the lack of publicly available information and corporate disclosure, this calculation should not be considered an accurate estimate of Nestlé's intake of palm oil-based animal feed throughout its dairy supply chain. Instead it should be considered the outcome of one specific scenario that relies on a number of assumptions. In developing this scenario an effort was made to use figures published by industry actors wherever possible.

The following figures and assumptions were used:

Nestlé Company information

- Annual intake of 12 million tonnes of milk.[169]
- Annual use of 445,189 tonnes of palm oil (CPO 306,536 tonnes and CPKO 138,653 tonnes). Based on Nestlé's RSPO 2022 disclosure report.[170]
- It is assumed that Nestlé's claim that 96% of its supply chain has no-deforestation excludes any palm oil used in animal feed in the production of milk supplied to Nestlé.[171]

Milk production

- Cows produce milk for ten months each year and are presumed to be fed with feed additives during this period.[172]
- For milk average milk production per cow, EU averages of 7,653 kg were used.[173]

Feed additives

- Palm-based feed additives have a frequent industry recommended dosage of 500g per day for lactating cows, although some providers prescribe up to 800g per day.[174,175]
- The average palm oil content of feed additives is estimated to be 85%. With no public data and statistics found it is not possible to accurately estimate the average palm oil content of palm oil-based feed used. For instance, Wilmar's products for dairy cows have palm oil fatty acid content of between 80% and 99%.[176]
- The uptake of palm-based feed additives is assumed to be 10% of the milk supply. No detailed public global or national statistics about the uptake of palm oil-based animal feed could be found for this report. However, in Canada this can be as high as 90% in some provinces.[177] Anecdotal information from industry insiders for this report also suggest higher than 10% percent update in the USA. No figures could be found for some of Nestlé's other main milk collection regions including such as Europe or Asia.

Palm oil conversions

- Converting palm kernel feed to crude palm oil equivalent uses a factor of 10 (10 tonnes of crude palm oil to produce 1 tonne of kernel oil) as described by Nestlé.[178]
- Converting PFAD feed to crude palm oil equivalent uses a factor of 27 (27 tonnes of crude palm oil needed to make one ton of PFAD).[179]

Calculation

- Using Nestlé's annual milk intake figure and the average milk yield per cow the total number of cows supplying Nestlé globally was estimated and multiplied with the daily recommended dosage of palm oil-based animal feed additives.
- This figure was then adjusted by the assumed palm oil content of 85% and a scenario of 10% of the cows being fed on the products (see assumptions above).
- Nestlé's reported palm oil use according to its disclosure to the RSPO[180] was converted to crude palm oil equivalent. The calculated use of palm oil-based animal feed was also converted to crude palm oil, using the conversion figures above.
- Finally, the additional palm oil in the Nestlé supply chain was calculated from this and presuming it was not included in the company's deforestation claim, that figure was adjusted from 96% to 72%

ENDNOTES

1 Global Witness. "Products in US supermarkets linked to deforestation of tropical forests." Accessed May 2024.

2 Volac Wilmar. "Rumen-protected fats - calcium salt supplements." Accessed May 2024.

3 Dairy Global. "Calcium salt fat supplements for cows – why size matters." Accessed May 2024.

4 Farmers Weekly. "Can palm-oil be replaced in feed to help cut dairy emissions?" Accessed May 2024.

5 Volac Wilmar. "Rumen-protected fats - calcium salt supplements." Accessed May 2024

6 The Globe and Mail. "The dairy industry's use of palm oil breaches its moral contract with Canadians." Accessed May 2024.

7 Indonesia Customs data, 2021.

8 Golden Agri Resources. "PFAD." Accessed May 2024.

9 Xu, H. et al." Life-cycle energy use and greenhouse gas emissions of palm fatty acid distillate derived renewable diesel." Accessed May 2024.

10 Transport & Environment. "Oil major Total undermining French palm oil diesel law with doublespeak." Accessed May 2024.

11 Ministry of Plantation and Commodities, Malaysia. "Data Statistics On Commodities 2022." Accessed May 2024.

12 Golden Agri Resources. "PFAD." Accessed May 2024.

13 Rainforest Foundation Norway. "PFAD and biofuels."Accessed May 2024.

14 Rainforest Foundation Norway. "Destination deforestation." Accessed May 2024.

15 Pestell Nutrition. "Silverprills." Accessed May 2024.

16 Subroto, E. & Nurannisa, R.L. "The Recent Application Of Palm Stearin In Food Industry: A Review." Accessed May 2024.

17 The Globe and Mail. "Buttergate: Butter not as soft as it used to be? The pandemic and our urge to bake is partly to blame – along with palm oil." Accessed May 2024.

18 Dairy Farmers of America. "Dairy Farmers of Canada comments on the consistency of butter." Accessed May 2024.

19 Misic, J et al. "Data deficits and transparency: What led to Canada's 'buttergate' ." Accessed May 2024.

20 Ibid.

21 Dairy Farmers of America. "Dairy Farmers of Canada convening expert committee on fat supplementation in cow feed ." Accessed May 2024.

22 Dairy Farmers of America. "Consider using alternatives to palm supplements, says Dairy Farmers of Canada." Accessed May 2024.

23 Misic, J et al. "Data deficits and transparency: What led to Canada's 'buttergate'." Accessed May 2024.

24 Marangoni, A.G. "Higher palmitic acid and dipalmitoyloleate levels are correlated to increased firmness in commercial butter." Accessed May 2024.

25 CBC. "Melting butter hard? Palm oil may be the culprit, says food researcher." Accessed May 2024.

26 Commercial US customs data provider

27 FAO. "Crops and livestock products." Accessed May 2024.

28 Misic, J et al. "Data deficits and transparency: What led to Canada's 'buttergate'." Accessed May 2024.

29 Confidential industry source

30 Commercial US customs data provider

31 Rainforest Action Network. "Keep Forests Forests Standings 2023 Scorecard." Accessed May 2024.

32 Nestle. "Our approach to deforestation and conversion risks for embedded soy.", Unilever. "CDP - Unilever plc CDP Forests Questionnaire 2023.", Mars. "Soy Sourcing & Deforestation Action Plan | 2022 Progress Update." Accessed May 2024.

33 Rabobank. "Global Dairy Top 20." Accessed May 2024.

34 Rainforest Action Network. "Keep Forests Forests Standings 2023 Scorecard." Accessed May 2024.

35 Arla. "Arla Foods' Responsible Sourcing Policy for Palm." Accessed May 2024

36 Arla. "Arla Foods' Commitment to No Deforestation and No Conversion." Accessed May 2024

37 Ferrero. "Ferrero Palm Oil Charter." Accessed May 2024

38 Nestlé. "Deforestation-free supply chains." Accessed May 2024

39 Mars. "Deforestation & Land Use Change Position." Accessed May 2024

40 Mondeléz. "Deforestation." Accessed May 2024

41 Unilever. "People & Nature Policy." Accessed May 2024

42 Danone. "Renewed Forest Policy." Accessed May 2024

43 Fonterra. "Palm Oil." Accessed May 2024

44 FrieslandCampina. "FrieslandCampina commitment to zero deforestation and zero conversion." Accessed May 2024

45 Lactalis. "For A Zero Deforestation And Conversion Palm Oil." Accessed May 2024

46 Mengniu. "Mengniu Sustainable Palm Oil Policy." Accessed May 2024

47 Danone. "Renewed Forest Policy." Accessed May 2024

48 Ferrero. "Ferrero Palm Oil Charter." Accessed May 2024

49 FrieslandCampina. "FrieslandCampina commitment to zero deforestation and zero conversion." Accessed May 2024

50 Mars. "Palm Oil Policy." Accessed May 2024

51 Mengniu. "Mengniu Sustainable Palm Oil Policy." Accessed May 2024

52 Nestlé. "Sustainably Produced Palm Oil at Nestlé." Accessed May 2024

53 Unilever. "People & Nature Policy." Accessed May 2024

54 Arla. "Arla Foods' Responsible Sourcing Policy for Palm." Accessed May 2024

55 Mondeléz. "Snacking Made Right – 2022 ESG Report." Accessed May 2024

56 Arla. "Arla Foods' Responsible Sourcing Policy for Palm." Accessed May 2024

57 Arla. "Arla Foods' Responsible Sourcing Policy for Palm." Accessed May 2024

58 Danone. "Forest Annual Update 2022." Accessed May 2024

59 Ferrero. "Dairy Charter." Accessed May 2024

ENDNOTES (CONT'D)

60 FrieslandCampina. "FrieslandCampina commitment to zero deforestation and zero conversion." Accessed May 2024

61 Mondeléz. "Snacking Made Right – 2022 ESG Report." Accessed May 2024

62 Saputo. "Sustainable Agriculture Policy." Accessed May 2024

63 Unilever. "CDP - Unilever plc CDP Forests Questionnaire 2023." Accessed May 2024

64 Ibid.

65 Lactalis. "Sustainability Report 2022." Accessed May 2024

66 Lactalis. "For A Zero Deforestation And Conversion Palm Oil." Accessed May 2024

67 Ferrero. "Dairy Charter." Accessed May 2024

68 Ferrero. "Ferrero Palm Oil Charter." Accessed May 2024

69 Ferrero. "Dairy Charter." Accessed May 2024

70 Nestlé. "Deforestation-free supply chains." Accessed May 2024

71 Nestlé. "Working with dairy farmers." Accessed May 2024

72 Nestlé. "Responsibly sourced palm oil." Accessed May 2024

73 Golden Agri Resources. "PFAD." Accessed May 2024.

74 Rainforest Action Network. "Keep Forests Forests Standings 2023 Scorecard." Accessed May 2024.

75 Unilever. "Sustainable and deforestation-free palm oil." Accessed May 2024

76 Unilever. "Our progress towards a deforestation-free and traceable supply chain." Accessed May 2024

77 Unilever. "Unilever Deforestation-Free And Conversion-Free Verification Protocol Scheme Rules Vdf 2023." Accessed May 2024

78 US Customs and Border Protection. "Ruling H312954." Accessed May 2024

79 European Parliament. "EU Deforestation Regulation." Accessed May 2024

80 Ibid.

81 Arla. "Annual Report 2023." Accessed May 2024

82 Danone. "Responsible Sourcing - Milk." Accessed May 2024

83 Ferrero."Source Ingredients Sustainably." Accessed May 2024

84 FrieslandCampina. "The cooperative: for farmers by farmers." Accessed May 2024

85 Lactalis. "2022 Activity Report." Accessed May 2024

86 Nestlé. "Supply Chain Disclosure for Dairy." Accessed May 2024

87 Unilever. "Ben & Jerry's – Hellendoorn." Accessed May 2024

88 Fonterra."Heerenveen." Accessed May 2024

89 Mars. "Mars Wrigley Europe commits to 100% responsibly sourced cocoa from 2023." Accessed May 2024

90 Mondeléz."Germany & Austria." Accessed May 2024

91 Ausnutria. "About Ausnutria." Accessed May 2024

92 Ausnutria. "Declining Ausnutria results due to challenges in Chinese market." Accessed May 2024

93 Danone. "Forest Annual Update 2022." Accessed May 2024

94 Ferrero. "Annual Palm Oil Progress Report 2022." Accessed May 2024

95 Ferrero. "Annual Palm Oil Progress Report 2021." Accessed May 2024

96 Mars. "Mars Palm Positive Plan Delivers Deforestation-Free Palm Oil Supply Chain." Accessed May 2024

97 Arla. "Arla Foods' Responsible Sourcing Policy for Palm." "Arla Foods' Commitment to No Deforestation and No Conversion." Accessed May 2024

98 Arla. "Arla Foods' Responsible Sourcing Policy for Palm." Accessed May 2024

99 Ibid.

100 Ibid.

101 Danone. "Renewed Forest Policy." Accessed May 2024

102 Ibid.

103 Danone. "Forest Annual Update 2022." Accessed May 2024

104 Ibid.

105 Ferrero. "Ferrero Palm Oil Charter." Accessed May 2024

106 Ibid.

107 Ferrero. "Dairy Charter." Accessed May 2024

108 Ferrero. "Annual Palm Oil Progress Report 2022." Accessed May 2024

109 Fonterra. "Palm Oil." Accessed May 2024

110 Fonterra. "Palm Products Sourcing and Procurement." Accessed May 2024

111 Fonterra. "Palm Oil." Accessed May 2024

112 FrieslandCampina. "FrieslandCampina commitment to zero deforestation and zero conversion." Accessed May 2024

113 Ibid.

114 Ibid.

115 Lactalis. "For A Zero Deforestation And Conversion Palm Oil." Accessed May 2024

116 Mars. "Deforestation & Land Use Change Position." Accessed May 2024

117 Mars. "Our Palm Oil Policy." Accessed May 2024

118 Mars. "Mars Palm Positive Plan Delivers Deforestation-Free Palm Oil Supply Chain." Accessed May 2024

119 Mengniu. "Mengniu Sustainable Palm Oil Policy." Accessed May 2024

120 Ibid.

121 Mondeléz. "Deforestation." Accessed May 2024

122 Mondeléz. "Snacking Made Right – 2022 ESG Report." Accessed May 2024

123 Ibid.

124 Nestlé. "Deforestation-free supply chains." Accessed May 2024

125 Nestlé. "Sustainably Produced Palm Oil at Nestlé -2021 Progress Report." Accessed May 2024

126 Nestlé. "Responsibly sourced palm oil." Accessed May 2024

ENDNOTES (CONT'D)

127 Saputo." Sustainable Agriculture Policy." Accessed May 2024

128 Ibid.

129 Unilever. "People & Nature Policy." Accessed May 2024

130 Ibid.

131 Unilever. "CDP - Unilever plc CDP Forests Questionnaire 2023." Accessed May 2024

132 UIbid.

133 Unilever. "Sustainable and deforestation-free palm oil." Accessed May 2024

134 Wilmar. "No Deforestation, No Peat, No Exploitation Policy." Accessed May 2024

135 Ibid.

136 Nutracor. "WASB Sustainability Policy." Accessed May 2024

137 Ibid.

138 Permata Group. "Sustainability Policy." Accessed May 2024

139 Ibid.

140 Musim Mas. "Sustainability Policy." Accessed May 2024

141 Ibid.

142 IOI Group. "No Deforestation, No Peat, No Exploitation Policy." Accessed May 2024

143 Bakrie Sumatera Plantations. "Sustainability Palm Oil Policy." Accessed May 2024

144 Golden Agri Resources. "Social And Environmental Policy." Accessed May 2024

145 3F Industries. "Sustainable Palm Oils." Accessed May 2024

146 Sintong Abadi. "Sustainable Palm Oil." Accessed May 2024

147 Wilmar. "No Deforestation, No Peat, No Exploitation Policy." Accessed May 2024

148 Ibid.

149 Perdue Agribusiness. "Palm Oil Sustainable Sourcing Policy." Accessed May 2024

150 Ibid.

151 The Consumer Goods Forum. "Home Page." Accessed May 2024.

152 The Consumer Goods Forum. "Our Members." Accessed May 2024.

153 The Consumer Goods Forum. "Resolutions & Commitments." Accessed May 2024.

154 Ibid.

155 The Consumer Goods Forum. "Forest Positive Annual Report 2023." Accessed May 2024.

156 The Consumer Goods Forum. "Commodity Roadmaps." Accessed May 2024.

157 The Consumer Goods Forum. "Forest Positive Annual Report 2023." Accessed May 2024.

158 Ibid.

159 The Consumer Goods Forum. "Palm Oil Roadmap Version 1.9." Accessed May 2024.

160 The Consumer Goods Forum. "Palm Oil DCF Methodology." Accessed May 2024.

161 The Consumer Goods Forum "Guidance on the Forest Positive Soy Roadmap." Accessed May 2024.

162 The Consumer Goods Forum. "Forest Positive Annual Report 2023." Accessed May 2024.

163 Ibid.

164 The Consumer Goods Forum. "Danone Performance Profile." Accessed May 2024

165 The Consumer Goods Forum. "Mars Performance Profile." Accessed May 2024.

166 The Consumer Goods Forum. "Mondelēz Performance Profile." Accessed May 2024.

167 The Consumer Goods Forum. "Nestlé Performance Profile." Accessed May 2024.

168 The Consumer Goods Forum. "Unilever Performance Profile." Accessed May 2024.

169 Nestlé. "Working with dairy farmers." Accessed May 2024.

170 RSPO. Nestlé. "Annual Communication of Progress 2022." Accessed May 2024.

171 Nestlé. "Deforestation-free supply chains." Accessed May 2024.

172 The Dairy Site. "The Benefits Of Seasonal Dairy Operations." Accessed May 2024.

173 Eurostat. "Milk and milk product statistics." Accessed May 2024.

174 Pestell. "Products." Accessed May 2024.

175 Volac Wilmar. "Products." Accessed May 2024.

176 Volac Wilmar. "Products." Accessed May 2024

177 The Globe And Mail. "The dairy industry's use of palm oil breaches its moral contract with Canadians." Accessed May 2024.

178 Nestlé. "Responsibly sourced palm oil." Accessed May.

179 Golden Agri Resources. "PFAD." Accessed May 2024.

180 RSPO. Nestlé. "Annual Communication of Progress 2022." Accessed May 2024.

PUBLICATION DATE: May 2024
PHOTO: Paul Hilton / RAN
COVER: migin / iStock

Rainforest Action Network
425 Bush Street, Suite 300
San Francisco, CA 94108 | RAN.org