How Nutreco's RoadMap 2025 Could Be a Game Changer for Animal Feed Sustainability

2020 came and went, along with a flurry of unmet corporate climate commitments. With no time to lose to meet the challenges of climate change, we need both ambitious goals and for companies to push themselves to achieve them. Animal protein has been heralded as one of the biggest contributors to greenhouse gas (GHG) emissions, contributing 14.5% of global GHG. Feed is often the largest component of animal protein's GHG emissions, with the exception of ruminant production.[1] Feed production contributes to climate change through its use of resources such as land, water, and fertilizer, and is one of the leading contributors to deforestation and habitat conversion. Despite this, many feed companies lag in sourcing transparency and progress toward making and meeting environmental commitments. Nutreco is looking to buck this trend and lead the industry in a different direction through ambitious goals, greater transparency in progress toward meeting them, and sharing what it has learned along the way.

The old adage "you can't manage what you don't measure" is timeless for a reason. It's long past time for companies to move away from intangible goals that are easy to explain away when not met and move towards ambitious, tangible, and measurable goals, which must address the areas of greatest impact and be accompanied by solid plans for and progress towards meeting them.

Transparency efforts can achieve an even greater impact by sharing how plans are implemented, enabling the entire industry to make progress on sustainability goals more quickly.

Nutreco's previous 2020 goals, set in 2012, were like much of the rest of the sector – largely impossible to measure and not bold enough to meet its proportional climate impact. Around 85% of the goals were met, but due to regional production differences and the immaturity of market demands, some were not possible to achieve. Other barriers included an inconsistent definition of sustainability, lack of agreement about which impacts are most important or how to measure them consistently across landscapes and companies, and lack of implementing stakeholder involvement in goal creation.

[1] http://www.fao.org/news/story/en/item/197623/icode/

Nutreco by the numbers

>100 production plants in 37 countries

>12,000 employees

€6.4 billion revenue

>4,000 employees in growth geographies

9 million tons of animal nutrition products

Nutreco chose the expiration of the 2020 goals as a pivotal moment to address these gaps and develop a new set of ambitious, measurable goals with a shorter time horizon of 2025.[2] To do so, the company determined it was critical to involve stakeholders beyond the executive suite, taking a bottom-up approach to get the buy-in of staff who would implement changes on the ground, as well as external stakeholders such as suppliers and customers, whose participation would be needed to reduce environmental impacts within the supply chain. These stakeholders provided input on a materiality assessment that identified a broad set of 18 issues facing the company and their input helped narrow these to three key pillars that make up RoadMap 2025: health and welfare, climate and circularity, and good citizenship.

To achieve the goals within these pillars, Nutreco spent time mapping where impacts related to the three pillars exist within the company, developing processes and systems to address them, and ensuring it is able to measure, report on, and monitor impacts.

Since developing RoadMap 2025, Nutreco has shifted from siloed sustainability goals toward embedding them in business strategy and operations throughout the company to ensure the goals receive the necessary focus and resources. To meet the goals, the business line (Skretting and Trouw Nutrition) functional directors take ownership of each issue within RoadMap 2025

Theme	Health & Welfare	Climate & Circularity	Good Citizenship
Focus (mandatory topics)	Anti-microbial resistance	Greenhouse Gas (GHG) emissions reductions	Diversity & Inclusion
We do this by...	Innovating new products and services that will directly reduce dependency on antibiotic usage in animal husbandry and adopting five-step targets that will significantly reduce antibiotic usage by creating business opportunities for clients.	Utilizing science-based targets to set targets for reducing emissions through energy efficiency programs and sustainable ingredients sourcing, incorporating life-cycle assessment methodologies, as well as utilizing new ingredients. Addressing responsible use of natural resources, biodiversity, and ecosystems in compound feed ingredients.	Addressing diversity and inclusion in staff. Additionally, empower local communities with best practices and technology to raise themselves out of extreme poverty through farming sustainability.
Soft targets	**Animal welfare**	**Packaging / Water / Waste**	**Stakeholder engagement**
nutreco	**Topics handled by other departments**	• Employee development • Occupational health & safety	• Human and labor rights • Products Quality Assurance

[2]https://www.nutreco.com/en/sustainability/sustainability-roadmap-2025/

goals and develop targets for their divisions. These functional directors then work with their respective teams in the operational companies across the 37 different countries where Nutreco works. For example, the division operations directors work with their operations managers at each production plant to come up with an energy efficiency plan to measure and reduce Scope 1 and 2 emissions.[3] Those same operations managers propose capital expenditures to upgrade electric motors, boilers, and fuels to transition to less impactful energy sources to reduce overall emissions. Another way Nutreco works toward its commitments is by developing tools and products in a co-creation process with key clients, whereby an environmental issue is mitigated by a co-developed solution that can go to market quickly since the demand is pre-determined, therefore helping to drive the change in supply.

PILLAR 1

Health and Welfare

Nutreco's first pillar, health and welfare, is centered around countering antimicrobial resistance. The World Health Organization (WHO) predicts that by 2050, 10 million deaths per year and economic damage equivalent to the 2008-2009 global financial crisis could result from drug-resistant diseases.[4] Antimicrobial resistance is largely caused by the overuse of antibiotics, some of which occurs within animal husbandry, where poor administration of antibiotics can also be a challenge. Due to its role as a nutritional solutions and farm services provider, Nutreco sees this as a critical area of work for its sustainability strategy. Nutreco plans to address antimicrobial resistance through a holistic approach to best practices in farming protocols and by working through its network of country offices to influence local legislation. It also plans to work collaboratively with clients to reduce antibiotic use overall while eliminating the use of antibiotics for growth promotion purposes and those classified as critically important for use in human medicine.

PILLAR 2

Climate and Circularity

The second pillar is climate and circularity, which involves working toward achieving Nutreco's approved Science-Based Targets (SBTs), as well as a goal of achieving the inclusion of 5-10% novel feed ingredients. To push this goal further, Nutreco could commit to a 1.5° C pathway; the current pathway aligned with the SBT is below 2° C but is not committed to 1.5°C. The Science Based Targets initiative (SBTi) also released guidance on setting corporate Net -Zero Standards in late 2021, which is another pathway Nutreco could adopt to strengthen its climate goals. Due to anticipated growth from the purchase of other companies, the Scope 3 goal is based on value-added

Nutreco's 2030 Science-Based Targets

Scope 1&2

30% reduction in absolute terms based on 2018 baseline

Scope 3

58% reduction target based on value added economic intensity (not absolute value)

[3]Scope 2 emissions include indirect GHG emissions from consumption of purchased electricity, heat, or steam. https://sciencebasedtargets.org/faqs#what-are-the-emissions-scopes-which-scopes-do-targets-have-to-cover

[4]https://www.who.int/news/item/29-04-2019-new-report-calls-for-urgent-action-to-avert-antimicrobial-resistance-crisis

economic intensity rather than absolute terms, to scale appropriately for anticipated changes. However, this risks reducing emissions intensity while increasing overall Scope 3 emissions due to growth, and Nutreco should reassess periodically based on its actual versus projected growth to ensure that its goals align with the SBTi's best practices. To do so, Nutreco needs to show that improved efficiency in acquisitions and existing operations together results in lower total emissions against the augmented baseline, not just lower emissions embedded in product. Acquisitions can be one of the best strategies to improve performance globally if companies deliberately target poorer performing companies.

Feed production is one of the leading drivers of deforestation and conversion, and the land use change associated with these activities is a key contributor to GHG emissions, making eliminating deforestation and conversion across supply chains among the most impactful interventions a company can take in its sustainability journey. Overfishing of forage fisheries to produce fishmeal is another driver that requires considering other ingredients to reduce the dependency on a few commodities, as well as working to ensure sustainable fishery management. One way to do this is to work with feed suppliers to trace ingredients and incentivize more sustainable production that takes deforestation, conversion, and overfishing out of the equation. Another way is to develop novel feed ingredients to reduce the amount of traditional commodity feed ingredients required, such as fishmeal and soybean meal, thereby alleviating some of the pressure to convert habitat or overfish, with the goal of reducing the overall carbon footprint of feed production. These approaches are not mutually exclusive; the scope of climate change necessitates tackling thorny challenges from multiple fronts at once.

Companies need to understand that both science and awareness will change over time. For example, it took many years for aquaculture feed companies to process soy so that it could be used in feed to take pressure off of fishmeal. Now, ten years later, it is clear that soy has considerable embedded emissions when produced through deforestation and conversion. Similar issues on the horizon include embedded emissions from bottom trawling for dedicated fishmeal and fish oil species, for by-products used for fishmeal and fish oil production, and whether microplastics are included in feed ingredients. These issues and more that may not yet be identified will need to be addressed by feed companies.

Novel ingredients to substitute for fishmeal and oil are a key area of active research and substitution. However, producing novel feed ingredients isn't so simple. Companies need to avoid creating unintended consequences and replacing one problem with another. In some instances, energy costs or water impacts may be higher for alternative feed ingredients, even as the land use-related carbon footprint may be lower. Such potential consequences should be evaluated and addressed as part of a novel ingredient growth strategy. Furthermore, most novel ingredients that exist today are

not currently available at scale, making even a modest target challenging to achieve. For Nutreco, 5-10% novel feed ingredients represent approximately 390,000 metric tons per year. For context, estimates of the total amount of novel ingredients globally available today is unlikely to surpass 200,000 metric tons.

The lack of globally available novel ingredients isn't the only barrier to scaling this solution. First, novel ingredients must perform as well as or better than conventional ones when it comes to nutrition and growth. Cost and demand, closely linked, are also critical challenges. Some novel feed ingredient producers are poised to scale up production, but the cost of the product is currently significantly greater than the value of the commodity ingredient it is meant to replace or supplement. Most likely, novel ingredients will always cost more initially, though they would be expected to be cheaper as they scale and as production becomes more efficient.

Like many sustainability solutions, novel ingredients require action across multiple stakeholders. While Nutreco may be able to buy some novel ingredients, the solution will likely fail if its customers do not buy the feed that includes them because it is too costly, and if retailers and other buyers of animal protein are unwilling to absorb a portion of the cost. This challenge can be met by partnering across all actors in the value chain to share incremental costs and collaborate on bringing costs down. Working with stakeholders pre-competitively through investing in innovation and considering other strategies to scale and spread costs throughout the value chain will prevent price increases from falling onto one actor.

One way Nutreco seeks to overcome barriers to reducing environmental impacts in feed is through Life Cycle Assessments (LCAs). Nutreco plans to begin using LCA methodology across its product spectrum and sharing the results with clients so that clients have transparency into how much carbon is embedded in a product, though it is aware that LCA solutions should not be used in isolation.

For example, if a feed formulation results in lower embedded carbon while increasing the feed conversion ratio, the resulting effect could be more environmentally damaging overall, necessitating holistic analysis while using LCAs for decision making. Clients can then choose product mixes based on these criteria and hopefully increase demand for less carbon-intense products. This information can enable retailers and producers of animal protein to share how much carbon is embedded in their products, allowing for more transparent decision-making.

Currently, LCA methodology is not standardized. Stakeholders are using different standards and databases, making apples-to-apples comparisons challenging. This represents an area where Nutreco could contribute with others in the industry to focus on standardized processes and metrics.

Beyond LCAs, feed manufacturers need to begin disclosing what ingredients are in their feed to enable full transparency, something that the industry has avoided thus far. Sharing LCA data for feed configurations is a positive interim step toward greater transparency within the industry, but it is a flawed strategy on its own because LCAs do not capture the full breadth of environmental, social, and governance (ESG) impacts. LCAs lack the nuance that traceability would provide, and their scope doesn't include a view into potential human rights violations. Supplementing LCAs with other tools, such as traceability protocols and water and human rights risk assessments, would provide a more systemic approach to sustainable practices. Feed buyers are liable for everything in their product. As such, they need to know where all the ingredients in their feed come from and how they are produced so that retailers and animal protein producers can follow what is in their supply chain and mitigate and report on environmental impacts throughout it. This is at the heart of traceability and transparency. ESG screens for feed ingredients that are common across feed companies will also be essential for apples-to-apples comparisons between feed companies.

PILLAR 3

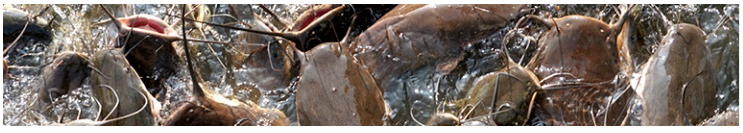
Good Citizenship

Nutreco's third sustainability pillar is good citizenship, including diversity, inclusion, and livelihoods. It includes hiring goals to increase diversity within the organization. Additionally, it targets improving the livelihoods of 12,000 small farmers through more sustainable economic growth programs, such as those Nutreco has been implementing in Nigeria and Guatemala. As of the time of writing, there are 870 small, marginalized farmers enrolled and participating in the Nigerian Community Development Project (see Appendix 2 for KPIs). The Guatemala initiative has been put on hold due to issues related to COVID-19, demonstrating both the challenges and the needs involved in working directly with communities producing commodities in various parts of the world. Human rights and labor issues are not included in this pillar and are addressed directly by the Human Resources and Ethics and Compliance departments, although current thinking about better practices suggests embedding these practices throughout business operations. A human rights consultant will be contracted in 2022 to map Nutreco's risk exposure and its opportunity to improve beyond its direct operations and Supplier Code of Conduct, which will pave the way to comply with the upcoming EU legislation on Human Rights Due Diligence. The mapping would include, for example, exposure to illegal or exploited labor from trimmings and by-products of some fisheries or the wages paid by small farmers in Nutreco's supply chains.

Beyond the Pillars

Beyond the three pillars, the company also has targets for reducing waste and water usage, as well as making packaging more sustainable. Solutions are adopted in regional offices with locally appropriate targets according to what is most relevant in each geography. As part of including the whole company on its sustainability journey of embedding goals throughout the organization, Nutreco believes that tangible, ambitious targets inspire staff. When RoadMap 2025 was launched, three countries still used coal. A goal was set to reach zero coal and fuel oil by 2030, but upon adopting RoadMap 2025, these countries accelerated action to meet their Scope 1 goals and are on track to eliminate coal and fuel oil use by 2024 by converting to liquefied natural gas (LNG). While LNG is an improvement over coal and fuel oil, it represents an interim solution toward renewable energy sources. Another example of how RoadMap 2025 inspired staff action was in Guatemala, where staff planned and executed the installation of solar panels on roofs at the Nutreco Guatemala premix plant to reach carbon neutral status ahead of schedule. Decisive action such as this has inspired other local offices to make timely progress on other goals.

RoadMap 2025 is simple and focused, with real, measurable targets, and a system for how to monitor progress each year. In the first quarter of each year,



every Operating Company (OpCo) completes an online assessment, the RoadMap 2025 Progress Assessment Tool. This tool has approximately 80 questions that track progress and score each OpCo on a 100% scale. This gives each OpCo General Manager and their management team a clear vision of their position relative to completing 100% of goals by December 2025. The Progress Assessment Tool enables them to measure progress each year and provides insight on where to focus efforts to improve and achieve reduction targets. Nutreco is also exploring having internal audit teams include this assessment in its internal audit program. In addition to reporting on positive progress, Nutreco has a track record of sharing what hasn't worked or where it has gone wrong; this has since become the most popular section of its annual sustainability report. The entire industry benefits from reporting on challenges so that everyone can make progress faster from learning about failures as well as successes.

Deforestation, in particular, is a thorny issue for feed companies. It represents both the biggest environmental impact as well as the most significant challenge. Without aligning as an industry, deforestation and conversion will only pass from one soy buyer to another, rather than disappearing. As of the end of 2020, Nutreco's performance progress on their Soy (and Palm Oil) Sourcing Policy can be seen in **Table 1** (below):[5]

Nutreco's progress toward Deforestation and Conversion-Free (DCF) sourcing is transparent in sharing data when sourcing information is not often publicly shared by the feed industry. Although Nutreco is committed to remaining in high-risk countries to use their influence for change, many companies are simply moving away from countries where deforestation is common to others where deforestation-free products are available. The concern with such moves is that when companies move to low or no risk geographies for sourcing products it does not help stop deforestation. Moreover, policies need to include conversion of other habitats such as grasslands, not just deforestation. Equally as important, nearly half of key commodities from high deforestation and

Table 1: Nutreco 2020 Soy and Oil Palm Performance

	Soy	Palm
Class A: The soy or oil palm ingredient is traceable back to a country or region with a low risk of deforestation or is from a region with a high risk of deforestation but purchased through a certification scheme which verifies no deforestation occurred. The supply chain must be physically segregated for Class A.	56%	3%
Class B: The soy or oil palm ingredient is traceable back to a country or region with a high risk of deforestation. For Class B it must be purchased through a certification scheme with a defined cut-off date, using either mass-balance or credits.	7%	50%
Class C: The soy or oil palm ingredient is traceable back to a country or region with a high risk of deforestation and must be purchased through a certification scheme that verifies no illegal deforestation occurred.	0%	0%
Class D: The soy or oil palm ingredient is traceable back to a country or region with a high risk of deforestation but purchased without any certification related to deforestation.	35%	47%
Do not buy: Untraceable	0.3%	0%
Currently missing data	<2%	<1%

Numbers are rounded, therefore totals might slightly deviate from 100%.

[5] https://www.researchgate.net/publication/333810941_Setting_the_bar_for_deforestation-free_soy_in_Europe_A_benchmark_to_assess_the_suitability_of_voluntary_standard_systems

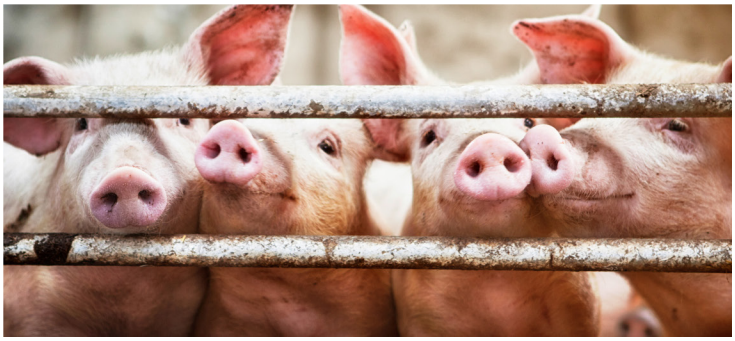
Class A consists of soy and oil palm ingredients that are certified deforestation-free with supply chains segregated from Classes B, C and D. The Profundo report titled 'Setting the bar for deforestation-free soy in Europe' was used to define which certification schemes fit Class A. In addition, it contains ingredients from countries with a low risk for deforestation. A country is seen as a low risk for deforestation if the carbon emissions from direct land use change by soy and oil palm cultivation does not exceed 1 mt CO2-eq/mt crop.

Class B supports the production of deforestation-free feed ingredients from soy and oil palm. This class contains several mass-balance, book & claim, and credits schemes and therefore the physical material does not need to be in segregated supply-chains from class C and D.

Class C soy ingredients meet the FEFAC soy sourcing guidelines, but are not robust enough to meet the criteria for Class A or B. In general, this class shows no illegal deforestation has occurred. There are no Class C palm certificates.







conversion risk areas outlined in the table above are not traceable, demonstrating that Nutreco will need to make meaningful progress quickly to meet its 2025 goals. To make a dent in deforestation and conversion, which are among the highest GHG impacts within the feed industry, companies should support the supply chain's transition to compliance and mobilize financial and technical support where it is needed to restore degraded land or pursue other policies to work within geographies where deforestation and conversion are a high risk.[6]

In addition to its Soy and Palm Sourcing Policy, Nutreco recently launched a Marine Ingredients Responsible Sourcing Policy.[7] This policy represents a positive step in transparently communicating sourcing practices; it also lays the groundwork for reporting against sourcing goals in future sustainability reports. The policy outlines sourcing criteria for whole fish, as well as by-products from aquaculture and wild caught fish, with requirements that ingredients are certified by Aquaculture Stewardship Council (ASC), Marine Stewardship Council (MSC), Best Aquaculture Practices (BAP), or a Global Sustainable Seafood Initiative (GSSI) recognized scheme, among other provisions, although WWF considers ASC and MSC to be minimum certification requirements, with other certifications lacking necessary rigor.[8] Nutreco can push this policy further by ensuring that the systems it uses and/or supports are interoperable and allow for traceability throughout its supply chain.

With 2025 just around the corner, it will be interesting to see how Nutreco progresses against its goals and shares continuous learning with the industry, as it has done with this paper, so that change can happen more quickly to address the urgent threat of climate change. Creating ambitious goals and increasing transparency around progress toward meeting them, including both the positive as well as hiccups along the way, is vital to industry transformation. The feed industry has been opaque for too long; now is the time to collaborate on eliminating deforestation and conversion, mitigating greenhouse gas impacts, and furthering other bold goals for people and planet. Nutreco's transparency is a positive example of how to set ambitious, measurable, yet realistic targets against which it can be held accountable as well as how to achieve them. We encourage other companies to follow suit to increase their sustainability ambitions, as well as work to accomplish more together and more quickly, in order to meet the challenges facing business, people, and nature.

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WWF
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Change at the speed of life

[6]Deforestation and Conversion Free Supply Chains: WWF Vision, Guiding Principles and Asks: https://wwfint.awsassets.panda.org/downloads/dcf_supply_chains___vision_principles_asks.pdf
[7]https://www.skretting.com/en-ca/news-and-stories/nutreco-and-skretting-raise-the-level-of-transparency-of-marine-ingredients-used-in-aqua-feeds-through-a-new-responsible-sourcing-policy/
[8]WWF also considers that byproduct and bycatch should come from sustainable fisheries and farms (with MSC or ASC certifications)

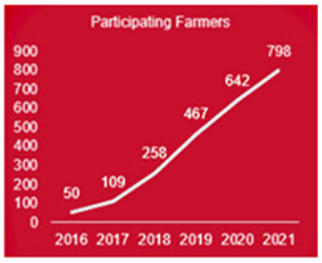
Appendix

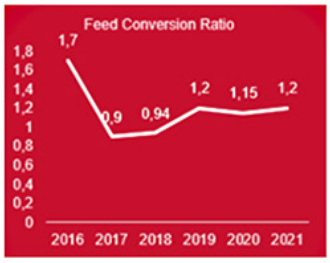
Appendix 1: RoadMap 2025 Goals

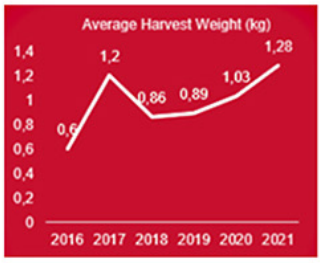
Health & Welfare	Climate & Circularity	Good Citizenship
No prophylactic use of antibiotics in feed	Science Based Targets towards 2030	Expand community development and community engagement initiatives to touch the lives of 12,000 people
No use of antibiotics for growth or use of coccidiostat	LCA + sustainability filter in innovation	Ratings + audits of high-risk suppliers
No use of listed "critically important for human health" antibiotics	100% deforestation-free	25% women in senior management
	100% of marine ingredients are certified	
	5-10% ingredients are novel*	
	100% recycled, reusable, or compostable packaging	
	0% coal and oil by 2030	
	0% waste to landfill	

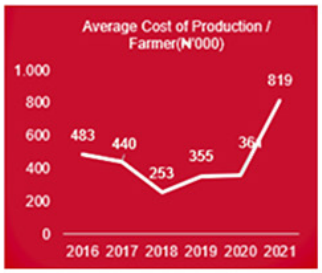
**Novel ingredients are defined as unconventional feed ingredients from plant, animal, and inorganic origins (not traditionally used by feed manufacturers), where after extensive R&D work and volume scale up, can be used as suitable alternatives for conventional ingredients in commercially relevant quantities.*

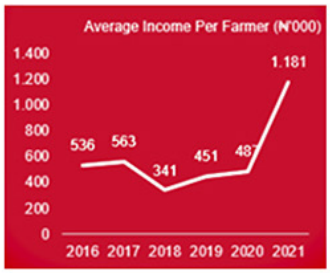
Appendix 2: Nigeria KPIs

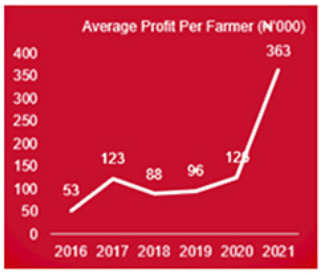








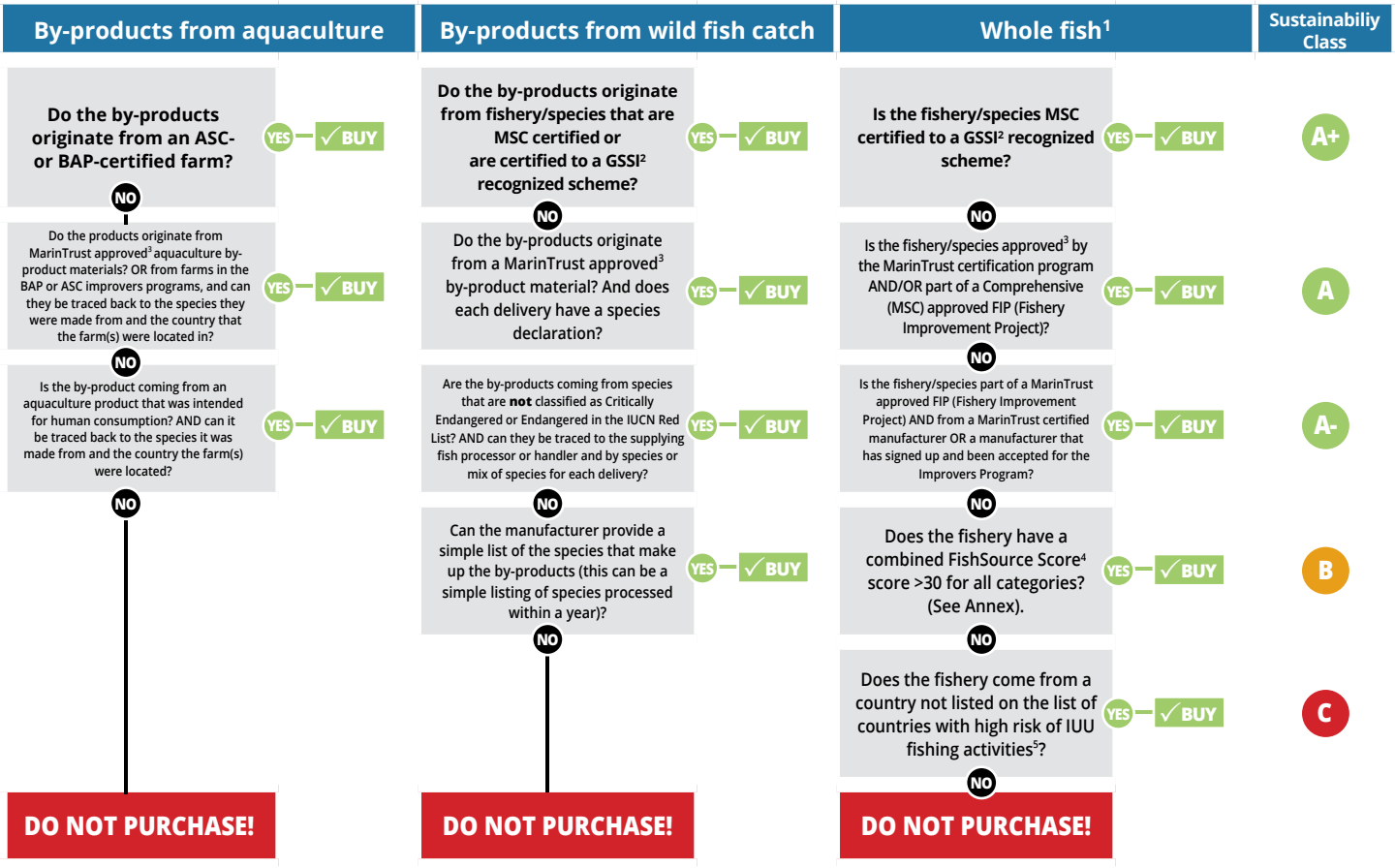




Average Cost of Production is driven by;
*Difference in number stocked 500-1,200pces
*Average weight at harvest increased
*High Inflation Rate
*Improved Management Practices

Appendix

Appendix 3: Marine Ingredient Sourcing Policy



1. If the fishery originates from a country with a high risk of slavery in the fishing sector (Annex 2 in the policy), the manufacturer in addition to Nutreco Code of Conduct fro Business Partners must fulfill the criteria specified in the policy - **regardless of certification status.**
2. Global Sustainable Seafood Initiative. **3.** Note that MainTrust has separate criteria for all three origins of materials. **4.** Sustainable Fisheries Partnership **5.** See Annex 1 in the policy: https://www.skretting.com/siteassets/20220303-skretting-marine-sourcing-policy-final.pdf?v=49366f
*References in Annex 1, 2, and 3.