ENVIRONMENTAL FOOTPRINT OF SKRETTING NORWAY SALMON FEED

2019

Use and origin of ingredients and environmental impact of products and operations

INDEX

ENVIRONMENTAL FOOTPRINT OF SALMON FEED

1 The Environmental Footprint Report 2019

PURPOSE AND SCOPE OF THE ENVIRONMENTAL FOOTPRINT REPORT

Skretting seeks to develop unique combinations of products, services and models that are designed to help farmers boost productivity, support animal health and minimise negative environmental impacts.

Skretting's commitment to sustainability is expressed through the Nuterra programme, which identifies the key sustainability issues facing the aquaculture industry and the actions Skretting undertakes to address them.

A number of our stakeholders, including customers, retailers and certification bodies require documentation of the environmental footprint of our products. As a responsible company, Skretting Norway is committed to make this information available in this report so that our customers can share it with their seafood buyers or other parties who request specific information.

The issues addressed under the umbrella "environmental footprint", relate to the areas where we have the most requests for information, and the areas where we at present are able to provide information of good quality.

This report describes the environmental footprint from Skretting feeds used to produce salmon and represents an average of the specific products used throughout the life cycle of the salmon.

The information provided here, is applicable to Skretting Norway fish feed and numbers are based on 2019 full year production. This footprint report is updated annually.

Trygve Berg Lea
Sustainability Manager, Skretting

2 Our products

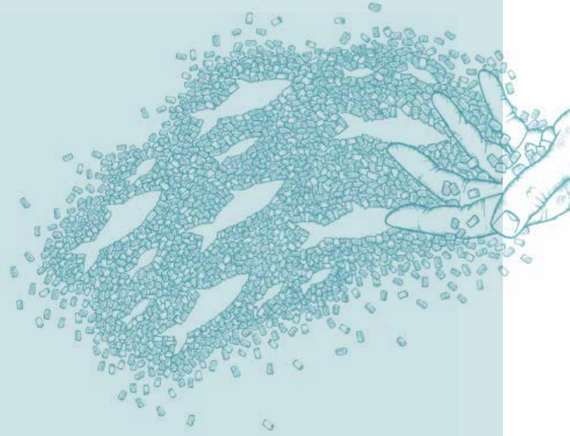
Skretting Norway has a large range of products for many aquaculture species. The focus here is on the most common products used in salmon farming in sea – which represents the bulk of our product sales.

TABLE 2.1

PRODUCT OVERVIEW

LIFE START	FEED EFFICIENCY	HEALTH & WELFARE
Specific hatchery and nursery nutrition for challenging first life stages. Transition diets and broodstock nutrition	High performance feed for maximum growth and feed efficiency potential. Nutritional solutions to enable raw material flexibility	Functional feed for proactive fish health and welfare support. Nutritional solutions for specific challenges
Typical products Nutra Sprint, Supreme, Vitalis	**Typical products** Spirit Plus, Premium, Prime, Express	**Typical products** Protec, Aqura, myProtec

MicroBalance™



Using technology that is based upon our latest understanding of essential micronutrients and how they interact with fish, MicroBalance allows us to replace one feed raw material with another without impacting performance, welfare or end-product quality.

Crucially, this innovation, which is the result of several decades of research conducted by the Skretting Aquaculture Research Centre (ARC), enables us to produce feeds with much lower fish meal content across several major species.

At a time when raw material prices are highly volatile, the raw material flexibility enabled by MicroBalance presents a major advantage over traditional aquafeeds. It reduces the aquaculture industry's dependence on raw materials that become too expensive by replacing them with less costly alternatives that maintain the same nutritional values. This raw material flexibility ensures that we supply aquaculture diets that are both more economically and environmentally sustainable.

The Edie Awards are some of the largest and most prestigious awards, and in 2019, Skretting was presented with the 'Sustainability Product Innovation of the Year 2019' for our MicroBalance FLX feeds for salmon containing zero fishmeal. It is a recognition for the efforts to limit use of marine ingredients in fish feed and the result of three decades of research.

protec™

Many salmon aquaculture systems are open to the natural environment, which exposes the fish to stress, such as extreme temperatures, handling and a range of parasites and diseases that can lead to negative health impacts. Skretting is committed to helping farmers secure animal health through continued investment in R&D, which helps to improve the sustainability of production by maintaining a high level of animal welfare as well as increasing the efficiency of production.

More than 20 years of research has given us the Protec products that help protect the skin, intestine and gills of aquaculture species. They support immune systems, add the building blocks for new cells and increase the level of antioxidants.

3 Nutritional solutions

USE OF WILD FISH FOR FEED

The salmon aquaculture industry has significantly reduced the inclusion rates of fish meal and fish oil from forage fish in salmon feeds during the past two decades. Skretting's Nuterra programme aims to support the trend toward lower inclusion rates as well as the increasingly efficient use of marine resources. Fish meal and fish oil are both limited resources that are shared across a range of users with increasing demands including direct human consumption, aquaculture and pork and poultry production. The Nuterra programme promotes the efficient use of these resources, producing increasing amounts of farmed salmon from a given input of fish meal and fish oil.

Our nutritional concept MicroBalance has made it possible to substitute fish meal and fish oil with other raw materials in diets for a number of aquaculture species. Fish oil is a limited raw material and our nutritional concept LipoBalance enables us to substitute fish oil with alternative oils.

Under the Nuterra programme, we regularly update the industry with our use of wild fish used to produce 1 kg of feed, based on the average, weighted raw material composition. The use of wild fish is expressed as the Forage Fish Dependency Ratio (FFDR). It will be calculated based on the use of fish meal and fish oil.

THE GLOBAL GOALS
For Sustainable Development

14 LIFE BELOW WATER

TABLE 3.1

USE OF WILD FISH IN FEED
(FORAGE FISH DEPENDENCY RATIO — FISH MEAL)

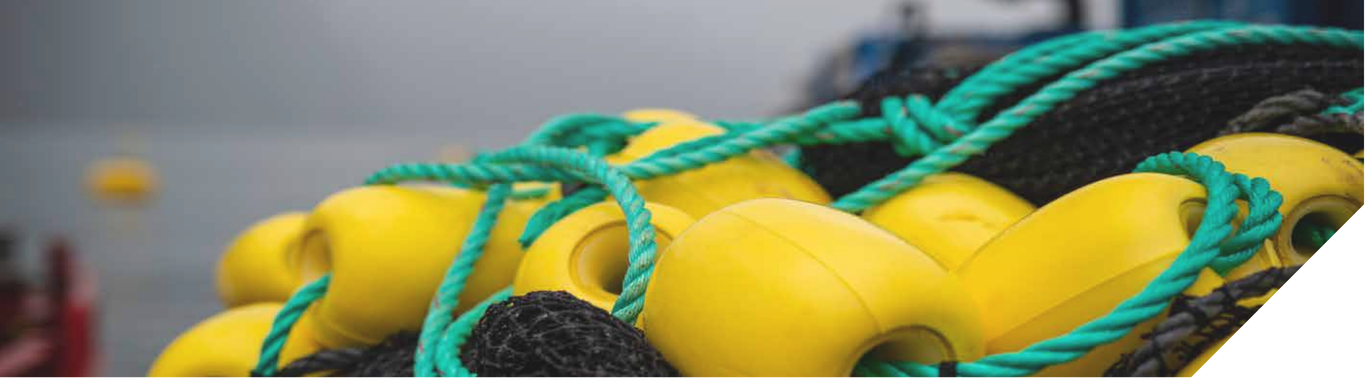
FORAGE FISH DEPENDENCY RATIO FISH MEAL	2014	2015	2016	2017	2018	2019	UNIT
PROPORTION FISH MEAL FROM TRIMMINGS	15.0	24.0	17	27.0	22.0	21.7	% — of total fish meal
TOTAL FISH MEAL	14.8	13.1	12.6	13.1	12.4	10.3	% — of total feed
MINUS FISH MEAL FROM TRIMMINGS	2.2	3.2	2.3	3.5	2.7	2.2	% — of total feed
FISH MEAL FROM WHOLE FISH	12.6	9.9	10.3	9.6	9.7	8.1	% — of total feed
FISH MEAL FROM WHOLE FISH PER KG FEED	126	99	103	96	97	81	grams
FISH MEAL YIELD, STANDARD NUMBER	23	23	23	23	23	23	% — yield of fish meal*
FFDRM PER KG FEED	0.53	0.43	0.45	0.41	0.42	0.35	kg wild fish per kg feed

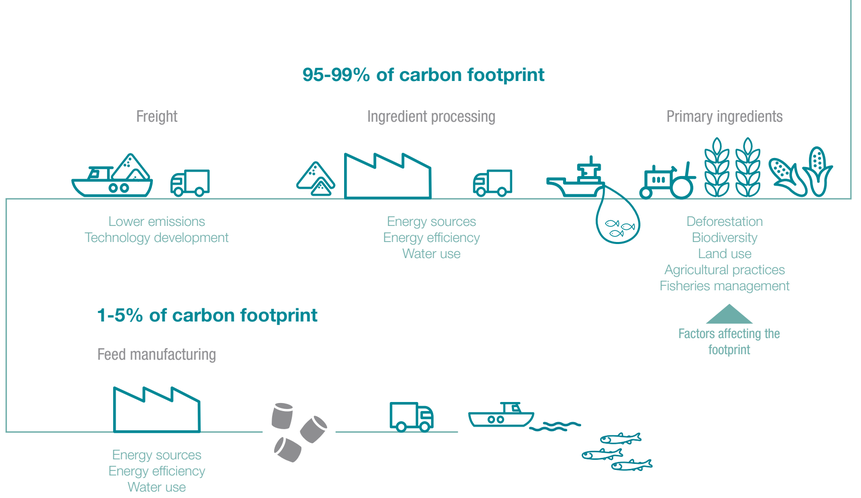
TABLE 3.2

USE OF WILD FISH IN FEED
(FORAGE FISH DEPENDENCY RATIO — FISH OIL)

FORAGE FISH DEPENDENCY RATIO FISH OIL	2014	2015	2016	2017	2018	2019	UNIT
PROPORTION FISH OIL FROM TRIMMINGS	20.0	26.0	20.0	32.0	26.0	12.0	% — of total fish meal
TOTAL FISH OIL	11.2	9.8	10.7	10.5	10.9	10.4	% — of total feed
MINUS FISH OIL FROM TRIMMINGS	2.2	2.6	2.2	3.4	2.8	1.2	% — of total feed
FISH OIL FROM WHOLE FISH	9.0	7.2	8.5	7.1	8.1	9.2	% — of total feed
FISH OIL FROM WHOLE FISH PER KG FEED	90	72	85	71	81	92	grams
FISH OIL YIELD ADJUSTED FOR GEOGRAPHICAL ORIGIN (ACCORDING TO THE ASC STANDARD)	5.0	5.0	5	6.3	6.5	6.0	% — yield of fish oil*
FFDRO PER KG FEED	1.79	1.44	1.70	1.13	1.24	1.52	kg wild fish per kg feed

** The yield refers to the amount of fish meal and fish oil one in average will get from processing 1 kg of wild fish. Typical figures from the industry refers to that one in average get 230 grams (23%) fish meal from processing 1 kg of wild fish and in average 50 grams to 70 grams of fish oil (depending on origin) from processing 1 kg of wild fish. The yield of fish oil will be highly variable – depending on species and season of the year.*





FOOTPRINT OF FEED

Feed plays an essential role in ensuring the health and wellbeing of farmed fish, and can greatly improve the efficiency of the aquaculture process. While gains are made in optimising feed efficiency, feed also contributes one of the biggest environmental impacts.

Carbon footprint is an estimate of the climate change impact of activity – for example producing one kilogram of aquaculture feed. Typically, a carbon footprint is calculated by estimating not just the CO_2 emissions that the activity in question causes, but also factors in emissions of other greenhouse gases (such as methane and nitrous oxide) and in some cases other types of climate impacts as well, for example the effect of deforestation. For simplicity, all these impacts are added together and expressed as a single number in terms of carbon dioxide equivalent (CO_2eq): the amount of CO_2 that would create the same amount of warming.

The true carbon footprint of one kilogram of feed includes not only the direct emissions resulting from the manufacturing process and the transportation of the feed to the farm.

It also includes a whole host of indirect emissions, such as those caused by growing the crops used in the feed, processing of feed ingredients, mining activities, production of vitamins, transport of the raw materials and so on. These are just a few of the processes involved. If you think about it, tracing back all the things that have to happen to make that feed leads to nearly an infinite number of pathways. In order to reduce the carbon footprint, we must look for reductions along the whole value chain.

NUTRIENT RELEASE

Nutrients such as phosphorus and nitrogen are essential for life and these elements occur naturally in the water column of both fresh and marine environments. In the environment they function as nutrients for algae growth. The reported nutrient discharge cannot be used to measure the effect of the nutrients in the environment (the farm site).

The effect of the nutrient load must be measured in the ecosystem through for example analyses of water and the surrounding environment of the farm.

Under the Nuterra programme, we will regularly update and inform the industry about the nutrient discharge of nitrogen and phosphorus from our standard product lines.

TABLE 3.3

CARBON FOOTPRINT OF SKRETTING NORWAY'S SALMON FEED

	MASS ALLOCATED WITH LAND USE CHANGE	MASS ALLOCATED WITHOUT LAND USE CHANGE	ECONOMIC ALLOCATED WITH LAND USE CHANGE	ECONOMIC ALLOCATED WITHOUT LAND USE CHANGE	UNIT
RAW MATERIALS	2,75	1,96	3,40	2,38	kg CO_2eq/kg
MANUFACTURING PROCESS	0,03	0,03	0,03	0,03	kg CO_2eq/kg
TOTAL — CARBON FOOTPRINT OF FEED (AT FACTORY GATE)	**2,78**	**1,99**	**3,43**	**2,41**	kg CO_2eq/kg

METHOD AND DATA

Functional unit: 1 kg of salmon feed (based upon average raw material composition)

System boundaries: From growing of crops and fishing of marine ingredients to finished feed pellets at factory gate. A cradle-to-gate assessment.

Method: The assessment is performed with respect to the established ISO standards for life cycle assessment. Skretting 2019 data are updated with more accurate data on micro ingredients and fully aligned with methodology of the SINTEF report "Greenhouse gas emissions of Norwegian seafood products in 2017".

Allocation: Mass allocation and economic allocation are used.

Impacts assessment method: IPCC 2013 GWP 100a v1.03.

TABLE 3.4

NUTRIENT RELEASE OF NITROGEN AND PHOSPHORUS. GRAMS PER KG OF FEED*

	NITROGEN	PHOSPHORUS
IN FAECES	7,6	5,5
DISSOLVED IN WATER	29,5	1,0
TOTAL DISCHARGE	**37,1**	**6,5**

**The actual emission can vary with body composition, feed waste and feed conversion factor.*

4 Responsible sourcing and use of feed ingredients

RESPONSIBLE SOURCING POLICY

Aquaculture feed can contain many different ingredients of vegetable, marine and land animal origin. The most common agricultural crops are soya, wheat and rapeseed. Marine ingredients traditionally originate from wild fisheries like sardine, anchovy, herring and many more. There are a number of sustainability issues linked to the primary production of feed ingredients. Cultivation of agricultural crops needs to be responsible; otherwise, it can lead to detrimental impacts like deforestation, loss of valuable habitats (for example rainforests and wetlands), excess use of water and soil erosion – to mention a few. A wild-capture fishery needs to be responsibly managed so that it is not overfished and dœs not lead to the unwanted catch of protected or endangered species.

The primary source of the feed ingredient is processed into different forms; wheat can be processed into wheat flour and wheat gluten, soya into soybean meal, soybean concentrate and soybean oil. A fish or by-products from fish can be processed into fishmeal and fish oil. This means that the primary sources of the feed ingredients are shipped to a factory and processed into the feed ingredient by manufactureres of feed ingredients. There are a number of sustainability issues that are common for manufacturers. For instance, the manufacturing process must not lead to environmental pollution like harmful emissions to air or effluents to water. Sustainability also encompasses social issues, including ensuring that the factory is a safe working place. In addition, manufacturers must respect basic human rights and labour rights.

Skretting operates a system of systematic evaluation of the sustainability risks linked to primary sources of feed ingredients and manufacturers of feed ingredients. Based on the outcome of these risk assessments, the combination of primary source and manufacturer of feed ingredient must be evaluated and approved before a Skretting company can buy the feed ingredient.

Our *Supplier Code of Conduct* enables us to engage with our suppliers on material issues relating to their operations and to set minimum criteria relating to environmental, social and legal aspects.

TRACEABILITY OF RAW MATERIALS

Raw material traceability is fundamental to the Nuterra programme. This requirement makes raw material sourcing more transparent in the value chain. For some feed ingredients this will demand traceability with regard to country of origin, while for marine raw materials we demand more detailed traceability back to the fishery from which the marine raw materials originated.

TABLE 4.1

AVERAGE RAW MATERIAL COMPOSITION OF 1 KG OF SALMON FEED IN 2019

FISHMEAL FROM WHOLE FISH	8.1
FISHMEAL FROM TRIMMINGS	2.2
VEGETABLE PROTEIN	
SOY PROTEIN CONCENTRATE	26.5
FABA BEANS	3.9
WHEAT GLUTEN	11.1
SUNFLOWER MEAL	1.3
GUAR MEAL	2.4
NOVEL PROTEINS	
INSECT MEAL	*
CALANUS	*
MARINE OILS	
FISH OIL FROM WHOLE FISH	9.2
FISH OIL FROM TRIMMINGS	1.2
MICRO ALGAL OIL	0.1*
FISH OIL FROM FARMED FISH	0.6
VEGETABLE OILS	
RAPESEED OIL	19.7
CAMELINA OIL	1.0
CARBOHYDRATES	
WHEAT	8.1
OTHER	4.6
TOTAL	**100.0**

** Insect meal, calanus and micro algal oils were used in small, but commercial quantities*

SOURCE OF MARINE RAW MATERIALS

Wild fish harvested from the ocean and processed into fish meal and fish oil are ingredients in salmon feeds. Small pelagic fisheries are used in the fish meal and fish oil industry, but in some regions they are also important for direct human consumption. Also known as forage species, these are small, short-lived species that occupy a low trophic level (LTL) in the ecosystem. Due to their specific population biology and dynamics, these species are frequently resilient to fishing pressure if catches are well managed, but overfishing is always a possibility without effective controls. Through the Nuterra programme, we strive to ensure that marine-based feed ingredients come from sustainable sources in the short- and long-term. The requirements aim to align industry incentives to support processes that will lead to improved fisheries management.

Under the Nuterra programme, all fish meal and fish oil originates from responsibly managed fisheries as defined by *Nutreco Supplier Code of Conduct* – requirements for marine raw materials.

TABLE 4.2

ORIGIN OF FISHMEAL AND FISH OIL FROM WHOLE FISH

SPECIES	LATIN NAME	FISHMEAL	FISH OIL	COUNTRY OF ORIGIN
ANCHOVY	*Engraulis Sp*	6.1 %	35.0 %	CHILE, PERU, PANAMA
BLUE WHITING	*Micromesistius Poutassou*	25.9 %	6.8 %	DENMARK, ICELAND, NORWAY
CAPELIN	*Mallotus Villosus*	0.1 %		NORWAY
HERRING	*Clupea Harengus*	8.0 %	6.9 %	DENMARK, ICELAND, NORWAY
MENHADEN	*Brevoortia patronus*	2.3 %	8.4 %	USA
HORSE MACKEREL	*Trachurus Trachurus*	0.2 %		DENMARK, ICELAND
CHILEAN JACK MACKEREL	*Trachurus murphyi*		0.1 %	CHILE
NORWAY POUT	*Trisopterus Esmarkii*	3.7 %	1.3 %	DENMARK, NORWAY
PACIFIC ANCHOVETA	*Cetengraulis mysticetus*		3.5 %	PANAMA
SANDEEL	*Ammodytes Marinus*	14.8 %	9.2 %	DENMARK, NORWAY
SPRAT	*Sprattus Sprattus Sprattus*	16.5 %	8.6 %	DENMARK, NORWAY
BALTIC SPRAT	*Sprattus Sprattus Balticus*	0.1 %	4.8 %	DENMARK
ARAUCANIAN HERRING	*Strangomera bentincki*		1.6 %	CHILE
SARDINE	*Sardinella Sp*		1.3 %	MAURITANIA
OTHER	*Multiple*	0.7 %	0.3 %	
TOTAL		78.4 %	87.8 %	

Skretting Norway has decided that we will only purchase fish oil and fish meal that is MarinTrust certified or if it is subject to a Fishery Improvement Project (FIP). This will be fully implemented from Q3 2020.

TABLE 4.3

ORIGIN OF FISHMEAL AND FISH OIL FROM TRIMMINGS

SPECIES	LATIN NAME	FISHMEAL	FISH OIL	COUNTRY OF ORIGIN
CAPELIN	*Mallotus villosus*	0.1 %		ICELAND, NORWAY
COD	*Gadus morhua*	2.0 %	0.2 %	DENMARK, ICELAND, NORWAY
HERRING	*Clupea harengus*	12.7 %	6.4 %	DENMARK, ICELAND, NORWAY
HORSE MACKEREL	*Trachurus trachurus*	0.1 %		NORWAY
MACKEREL	*Scomber scombrus*	4.3 %	4.6 %	DENMARK, ICELAND, NORWAY
POLLOCK	*Pollachius sp.*	0.9 %		DENMARK
SPRAT	*Sprattus sprattus sprattus*	0.3 %	0.1 %	DENMARK
TRIMMINGS — OTHER	*Multiple*	1.3 %	1.0 %	
TOTAL		21.6 %	12.2 %	

TABLE 4.4

ORIGIN OF FISHMEAL AND FISH OIL FROM FARMED FISH

SPECIES	LATIN NAME	FISHMEAL	FISH OIL	COUNTRY OF ORIGIN
FARMED SALMON	*Salmo salar*		100.0 %	NORWAY

TABLE 4.5

CERTIFICATION STATUS OF MARINE RAW MATERIAL

	FISHMEAL	FISH OIL
MARINTRUST AND MSC APPROVED MATERIAL	97 %	92 %
ASC APPROVED MARINE RAW MATERIAL	97 %	92 %
FIP MARINE RAW MATERIAL		5 %

USE OF SOY RAW MATERIALS IN FEED IN RELATION TO DEFORESTATION AND LOSS OF BIODIVERSITY

Tropical deforestation is widely regarded as one of the most serious global environmental problems of our time. As such, Skretting is committed to supporting raw material production initiatives that do not occur in regions subject to deforestation. We have also built long-term sustainable purchasing and supplier policies that prohibit the sourcing of soy products from lands that are illegally deforested. In addition, part of our purchasing policy is to encourage our suppliers to pursue certification according to recognised schemes for responsible production, especially when it comes to soy.

Under the Nuterra programme, soy raw materials originating from Brazil must come from responsible producers. They must not originate from areas of deforestation. Furthermore, soy producers must also ensure legal use of land and water, and respect the needs and rights of smallholders and indigenous people as well as protection of workers' health and rights.

All soy protein concentrate in Skretting Norway products originates from soya which is ProTerra certified (http://www.proterrafoundation.org/).

AQUACULTURE DIALOGUE GROUP ADVANCES BRAZIL'S SUSTAINABLE SOY AGENDA

Putting competitive differences to one side, in another initiative Skretting and fellow salmon feed producers Cargill Aqua Nutrition, BioMar and Mowi have joined forces with certification organisation ProTerra and a number of soy producers to ensure value chains are able to take a responsible approach to sourcing soy from Brazil.

Called the 'Aquaculture Dialogue on Sustainable Soy Sourcing from Brazil', this new roundtable group recognises that Brazilian agriculture practices and deforestation have come under intense environmental scrutiny, and also that with salmon feed often containing soy products from Brazil, these concerns could have implications for aquaculture supply chains.

While Norway's salmon feed producers only purchase certified deforestation-free soy from Brazil, the partners have identified that in the best interests of our planet's health and to help tackle the climate crisis, collaborative action is required in a number of key areas within the soy production sector. These include traceability, transparency, supplier code of conduct and deforestation.

Already, the dialogue group has put a new traceability system in place. Through this platform, each shipment delivered to feed producers now includes information about the municipalities and states from which the soy from that batch is sourced. This provides the means for us to quickly determine whether a farm is fully compliant with supply requirements and is also carefully abiding by all environmental, labour and human laws.

Through these new changes, it has been possible to establish long-term sustainable purchasing and supplier policies that prohibit the sourcing of soy products from land areas that are illegally deforested. Looking ahead, the group has also stated that it would welcome initiatives that move beyond a supply chain approach, to drive a forestpositive future.

NEW SPECIFIC, SCIENTIFIC DATA DEMONSTRATE A LOWER FOOTPRINT FOR BRAZILIAN SOY

One of Skrettings major supplier's of Brazilian soy, CJ Selecta, has completed a detailed life cycle analysis (LCA) of the production process and farms that grow their soy. In this analysis, their soy protein concentrate (SPC) has a carbon footprint of 1.93 kg CO_2e. The default value for Brazilian SPC is 6.69 kg CO_2e. That is 70% less CO_2 emissions than the generic database value.

We are in dialogue with CJ Selecta to confirm and verify that the figures are representative before being used. But it is encouraging that Brazilian soy producers are now mapping their own footprint based on deforestation soy.

The footprint of Norwegian salmon will thus be able to obtain a new and more precise numerical basis when calculating the footprint.

Improved traceability essential for calculating footprints

Ordinary Brazilian soy has a large calculated carbon footprint because agriculture in Brazil receives an extra footprint premium due to the country's extensive deforestation over the last 20 years. All soya used by Norwegian aquaculture comes from farms that are certified to have not been deforesting after 2008, but this is not taken into account in scientific calculations that require that there has been no deforestation in the last 20 years.

Footprint analyzes using standard values will then have a higher calculated footprint than analyzes that can now use detailed figures based on traceability rather than calculated average values.

Expects data from other soy producers

We expect figures for footprints from other important Brazilian suppliers. The new system for better traceability for the Brazilian value chain was the basis for the detailed calculations, and makes this possible. Each soybean load delivered to feed producers now contains information on which Brazilian municipalities and states have grown the soybean.

LCA report gives deforestation-free areas lower footprint

The LCA report from CJ Selecta traces the soy protein concentrate back to deforestation-free areas, which will then not be attributed to the carbon footprint from deforestation. This leads to a significant reduction of what has traditionally been calculated as the footprint of Norwegian salmon feed when the deforestation effect is taken into the carbon footprint.

The LCA analysis of SPC produced by CJ Selecta begins with the cultivation of soybeans in the Minas Gerais, Mato Grosso and Goiás areas. After harvest, the soybeans are shipped to their processing plant in Araguari, Minas Gerais.

Use of novel raw materials

In 2019 Skretting progressed in the use of novel feed ingredients. Novel ingredients are unconventional feedstuffs of plant or animal origin. Worldwide, there has been increased activity focused on the R&D of such ingredients with the aim to ascertain new protein raw materials and alternative sources of essential omega-3 long chain fatty acids for use in aquaculture feeds. The latest technologies include microbial and insect-based protein and oil sources, and already, algae oils containing EPA and DHA and high-quality proteins based on different insect species using waste streams as resources are commercially available.

INSECT MEAL

Skretting Norway continued to produce salmon feed with insect meal in 2019 after the introduction to the market in 2018. Insect meal offers an alternative to fish meal and soy and the fish show the same growth performance with feeds using insect meal as with traditional protein sources. Insects are an important food for the wild salmon, and we see that insect meal even can increase the feed intake of the fish.

Insect meal has the potential to be an important raw material in the future. The feed produced by the Skretting Norway factory contained insect meal made from the larvae of the black soldier fly, an EU approved commodity. Consumers are positive to eating salmon that had insect meal in the feed.

In the European market, there is now little available insect meal for use on a large scale, and Skretting is working with manufacturers who wish to come up at a commercial level. Ideally, by 2022 there will be at least five different European suppliers, each producing 20,000 tonnes of insect meal per year.

OMEGA-3 OIL FROM MICROALGAE

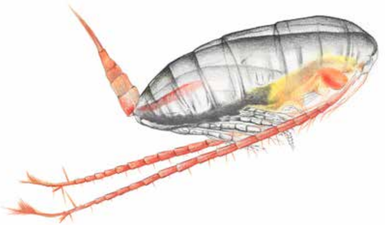
Norwegian salmon farmers have started feeding their salmon a diet produced by Skretting which includes omega-3 EPA + DHA algal oil. This has been possible due to the innovation from our collaborator Veramaris, a joint venture between DSM and Evonik, to produce industry-first marine algal oil containing both long-chain omega-3 fatty acids, EPA and DHA.

Fish oil has been difficult to substitute out of fish feed because previously the only source of EPA and DHA was pelagic fish harvested from the ocean. Despite being currently in good supply, fish oil is a limited resource and in high demand from a number of other feed, food and pharmaceutical sectors. However, fish cannot produce large amounts of long-chain omega-3 fatty acids. The original source is marine microalgae. Through the culture of microalgae, the fatty acids can be obtained while bypassing the marine food chain entirely. Feeding salmon with natural marine algal oil resonates strongly with the sustainability efforts of numerous retailers worldwide.

CALANUS — PLANKTON HARVESTING OPENED UP

The Norwegian authorities decided in 2019 to allow commercial harvesting of the zooplankter *Calanus finmarchicus*. This small copepod is probably the largest renewable and harvestable resource in the Norwegian sea, and it is only the new production or growth that is harvested. The quota is set at 254,000 tonnes, which is 0.08% of the new production that takes place every year in the Norwegian Sea - which is less than the scientific advice in order to have cautious approach to this new fishery. The authorities will closely monitor the harvesting of the biomass.

Skretting has tested this new raw material in fish feed for a long time, and the results have been positive. Looking for raw materials in the ocean harvesting from a lower trophic level is important for the quest for novel raw materials. Calanus looks promising, as it does not compete with food for human consumption and since it eats phytoplankton, it becomes an important link between phytoplankton production and fish. Skretting has committed to use this novel raw material in commercial feed, and is pleased to get access to this local protein resource.



USE OF GENETICALLY MODIFIED PLANT MATERIAL IN FEED

Under the principle of legal compliance Skretting Norway does not use any transgenic* plant raw materials in its products

Processed genetically modified foods must be approved by Food Act general regulations for production and marketing of food and feedstuffs. These regulations contain the key elements of EU legislation on the approval of genetically modified products. Those who want to use gentically modified feed ingredients in feeds in Norway must first apply to the Norwegian Feed and Food Safety Authorities (Mattilsynet) for approval of products, even in cases where the same transgenic feed raw material has already been approved in the EU. Approval is based on thorough risk assessments. When genetically modified materials have been approved, they shall comply with the labelling regulations and labelled accordingly in order that customers can make an informed choice. In addition, Norway has distinct regulations prohibiting genetically modified products that contain genes coding for antibiotic resistance.

Currently, Norwegian food and feed law has not approved any transgenic plants for use in food or feeds, and there is a mandatory requirement to disclose the use of transgenic* plant raw material to the customer.

**Defined as containing <0,9% transgenic materials in the plant raw material used. When less than 0,9% transgenic material is found, it must be the result of technical random and unavoidable pollution in the supply chain.*

5 Operations

Skretting seeks to minimise the negative impacts of our direct operations and create valuable employment opportunities for the communities in which we operate.

Skretting Norway is certified to a number of recognised standards within the area of food safety and environmental compliance.

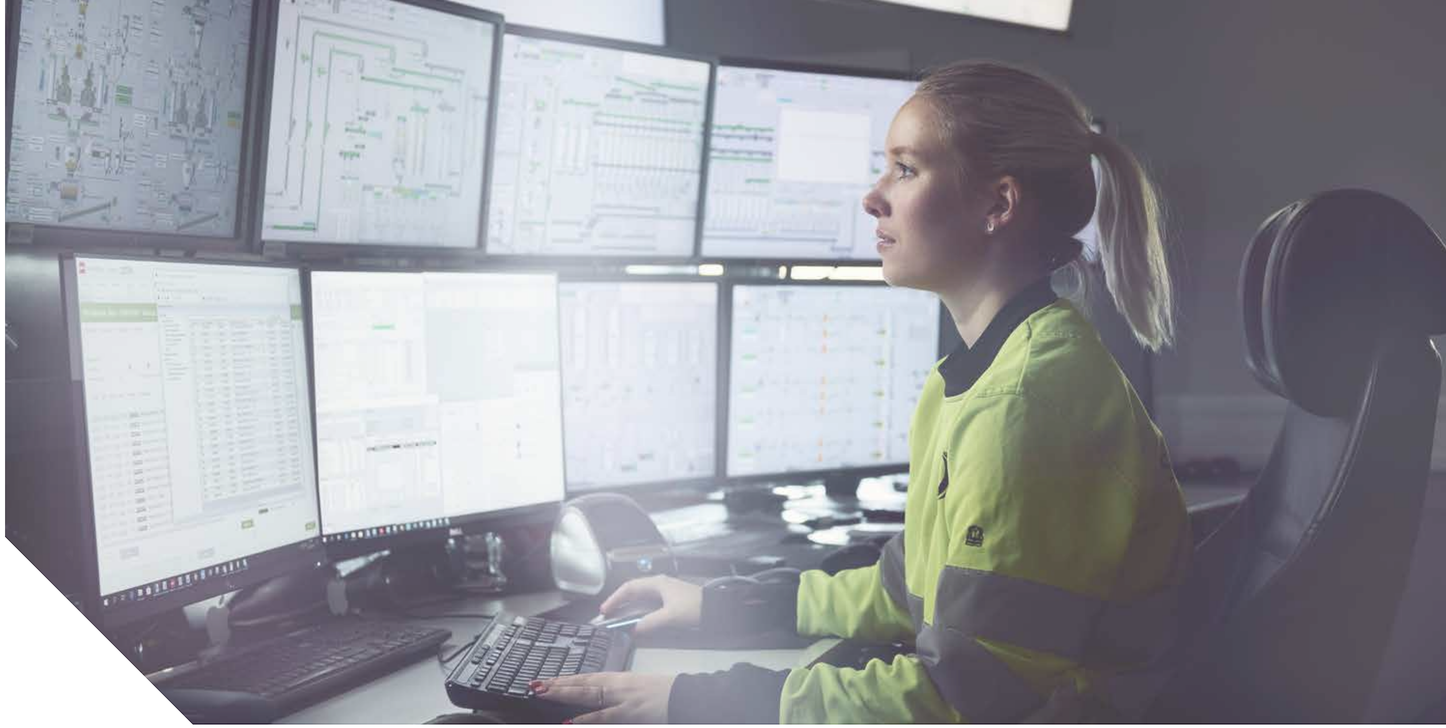


TABLE 5.1

SKRETTING NORWAY CERTIFICATION OVERVIEW

STANDARD	
NS-EN ISO 9001:2015	QUALITY MANAGEMENT SYSTEMS
NS-EN ISO 140001:2015	ENVIRONMENTAL MANAGEMENT SYSTEMS
ISO 22000:2005	FOOD SAFETY MANAGEMENT SYSTEMS
GLOBAL G.A.P. - GGN NUMBER: 4050373823641	COMPOUND FEED MANUFACTURING (NORWAY)
GLOBAL G.A.P. NON-GM/"OHNE GENTECHNIK" ADD-ON	COMPOUND FEED MANUFACTURING (NORWAY)
GLOBAL G.A.P. - GGN NUMBER: 4052852471015	COMPOUND FEED MANUFACTURING (FRANCE) - IMPORTED STARTER FEEDS
HAZARD ANALYSIS AND CRITICAL CONTROL POINTS (HACCP)	ALL 3 SKRETTING NORWAY FACTORIES HAS IMPLEMENTED HACCP (NOT CERTIFIED)
ASC RESPONSIBLE SALMON STANDARD	DELIVER ASC COMPLIANT FEED FOR PART OF THE PRODUCTION
DEBIO	APPROVED FOR PRODUCTION OF ORGANIC FISH FEED (STAVANGER PLANT)
LABEL ROUGE LA31-05	CERTIFIED FOR FRESH WATER FEED (AVERØY PLANT)

OPERATING IN COMPLIANCE WITH ALL APPLICABLE NATIONAL LAWS AND LOCAL REGULATIONS

Skretting operates in accordance with the Norwegian laws governing feed production.

These laws are:

- The food law
- The feed regulation
- Regulations on the use of feed ingredients
- Regulation on feed hygiene
- Regulation on labelling and trade of feed stuffs
- Sector regulation on feed production.
- Factory emission permits

Skretting's operations are registered with the Norwegian Feed and Food Authorities (Mattilsynet).

TABLE 5.2

SKRETTING NORWAY'S FEED PLANTS

REGISTRATION NUMBER	OPERATION
NO10050187	SKRETTING STAVANGER
NO10050270	SKRETTING AVERØY
NO10050269	SKRETTING STOKMARKNES

Skretting Norway also operates in accordance with the Pollution Control Act (Act of 13 March 1981 No.6 Concerning Protection Against Pollution and Concerning Waste).

Each operating plant has permits related to emissions to air, effluents to water and ground and handling of waste. Detailed description of permits for each operating plant together with historical records of emissions can be found here http://www.norskeutslipp.no/

Skretting Norway seeks to be a safe workingplace. In 2019 we registered 5 lost time injures (LTI), meaning that there where five incidents where people where hurt at work and had to stay away from work to recover.

TABLE 5.3

ENVIRONMENTAL FOOTPRINT OF OPERATIONS

ENVIRONMENTAL PERFORMANCE INDICATOR	VALUE	UNIT
ENERGY CONSUMPTION	218	KWH PER TONNE
CARBON EMISSIONS	26,5	CO_2 EQ KG PER TONNE
WATER WITHDRAWAL	473	LITERS PER TONNE
WASTE GENERATION	6	KG PER TONNE

6 Multi stakeholder involvement

ENGAGEMENT IN THE VALUE CHAIN

Skretting is of the opinion that we can only progress if we communicate to and enter into dialogues with stakeholders, in particular with our own employees, but also with society in general. Together with our parent company Nutreco we are involved in several multi stakeholder initiatives to improve sustainability in aquaculture.

In this report we would like to highlight some engagements on the following pages. For the full list of initiatives Skretting is involved in, please see our Sustainability Report.

MARINTRUST (FORMERLY KNOWN AS IFFO RS)

MarinTrust, formerly known as the Global Standard for Responsible Supply (IFFO RS) has become the leading independent business-to-business certification programme for the production of marine ingredients. Skretting is a member of the MarinTrust governance board.

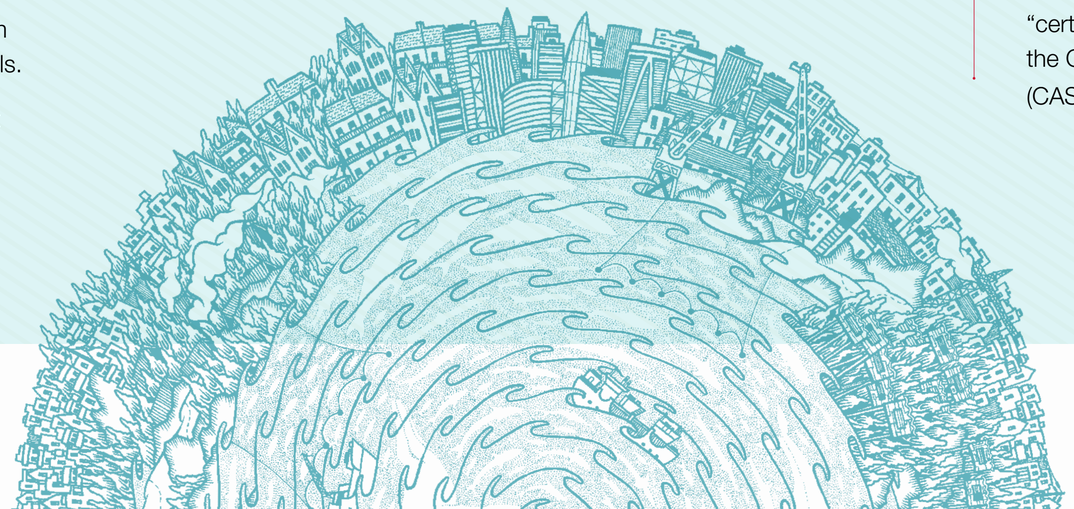
The main purpose of the standard is

- To ensure that whole fish used come from fisheries managed according to the FAO Code of Conduct for Responsible Fisheries.
- To ensure no Illegal, Unreported and Unregulated (IUU) fishery raw materials are used.
- To ensure pure and safe products are produced under a recognised Quality Management System, thereby demonstrating freedom from potentially unsafe and illegal materials.
- To ensure full traceability throughout production and the supply chain.

SUSTAINABLE FISHERIES PARTNERSHIP (SFP)

Skretting is a sponsor of the Sustainable Fisheries Partnership (SFP). SFP fills a specific gap between industry and the marine conservation community, utilising the power of the private sector to help less well-managed fisheries meet the environmental requirements of major markets. Their work is organised around two main principles: making available up-to-date information on fisheries for the benefit of major buyers and other fisheries stakeholders and using that information to engage all stakeholders along the supply chain in fisheries improvements and moving toward sustainability.

SFP operates through two main principles: information and improvement.



ENCOURAGING RESPONSIBLE FISHERY MANAGEMENT

Great strides have been made by the aquaculture industry to improve its responsible practices in recent years, with substantial efforts particularly focused on encouraging marine ingredient suppliers to ensure that they source raw materials from well-managed, sustainable fisheries.

A large number of fisheries in Europe and Americas today are certified to the MarinTrust standard. The Skretting Group has the ambition to source from only MarineTrust compliant fisheries and we support fisheries to embark on improvement projects so they can become certified according to the MarineTrust standard.

Currently, Skretting is engaged in three fishery improvement projects (FIPs). One of the most important fisheries in the world, the Peruvian anchovy fishery, is engaged in a FIP to achieve a “certifiable status” according to the guidelines of the Conservation Alliance for Sustainable Solutions (CASS).

THE PROTERRA FOUNDATION

Skretting is member of the ProTerra Foundation which is a not-for-profit organisation that advances and promotes sustainability at all levels of the feed and food production chain. A commitment to full transparency and traceability throughout the supply chain and concern for corporate social responsibility and the potential detrimental impact of herbicide-resistant, genetically modified crops on ecosystems and biodiversity is at the heart of everything we do.

Independent third party certification is central to the Proterra Foundation. ProTerra certification ensures that high quality supplies of crops, food, and feed are independently certified and produced with improved sustainability.

THE ROUND TABLE ON RESPONSIBLE SOY

Nutreco is member of the Round Table on Responsible Soy (RTRS) which is a civil organisation that promotes responsible production, processing and trading of soy on a global level.

RTRS encourages current and future soybean to be produced in a responsible manner to reduce social and environmental impacts while maintaining or improving the economic status for the producer through the development, implementation and verification of a global standard.

NEW YORK DECLARATION ON FORESTS

Skretting is a signatory of The New York Declaration on Forests (NYDF) which is a voluntary and non-binding international declaration to take action to halt global deforestation. It was first endorsed at the United Nations Climate Summit in September 2014, and by October 2017 the NYDF supporters grew to include over 191endorsers: 40 governments, 20 sub-national governments, 57 multi-national companies, 16 groups representing indigenous communities, and 58 non-government organisations.

These endorsers have committed to doing their part to achieve the NYDF's ten goals and follow its accompanying action agenda.

GLOBAL AQUACULTURE ALLIANCE

Skretting is a member of the Global Aquaculture Alliance (GAA) that promotes responsible aquaculture practices through education, advocacy and demonstration. For over 20 years GAA has demonstrated our commitment to feeding the world through responsible and sustainable aquaculture.

GAA dœs this by providing resources to individuals and businesses worldwide who are associated with aquaculture and seafood. They improve production practices through partnerships with countries, communities and companies, as well as online learning and journalism that boasts active readership in every country of the world.

GLOBALG.A.P.

Skretting is member of GLOBALG.A.P. which is an organisation that has developed criteria for food safety, sustainable production methods, worker and animal welfare, and responsible use of water, compound feed and plant propagation materials. Skretting is also a member of the technical committee that oversees the GLOBALG.A.P. aquaculture standard.

7 Skretting Norway's quantified targets for raw materials set in 2018

#1

Growth in Norwegian aquaculture shall not be covered by increasing the demand for soy in Brazil.

- Skretting Norway will not purchase more soy from Brazil than we did in 2018
- Feet on the ground in Brazil to work outside of our direct value chain.

We met the goal to not purchase more soy from Brazil as we purchased 15,500 mt less Brazilan soy in 2019 compared to 2018. The work will continue in the coming years in order to have the needed flexibility for alternative raw materials.

Skretting took action in Brazil in 2019 to prevent deforestation and protect wildlife outside of the salmon value chain. (See page 9 for more information).

#2 Find and foster alternative raw materials to enable sustainable growth of Norwegian aquaculture

- New vegetable protein raw materials will account for at least 10 percent of our feed by 2022
- Foster and purchase certified European soy
- Novel* raw materials will account for at least 6 percent of our feed by 2022

#3 Use of sustainable marine raw materials

- 100% of marine raw materials are MarinTrust certified or subject to a Fishery Improvement Project (FIP) by 2020

We are on the right track to meet the 10 percent goal of new vegetable protein by 2022, and we have also started to purchase large amounts of certified European soy, and will continue to work with our suppliers to continue this trend.

But the goal for novel raw materials can be difficult to achieve. Currently, very few novel ingredients are commercially available. and it is hard to make these solutions available at prices that are viable for the value chain.

To reach the 6 percent goal of novel raw materials we need to continue to work together with the young companies that provide these raw materials, and we need the continued support from the fish farmers. Skretting will continue to invest considerable resources into exploring the commercial application of these alternative ingredients.

Skretting Norway has decided that we will only purchase fish oil and fish meal that is MarinTrust certified or if it is subject to a Fishery Improvement Project FIP. This will be fully implemented from Q3 2020.

**Novel raw materials are ingredients from unconventional feedstuffs of plant or animal origin. Such as microbial, insect-based and microalgae protein and oil sources.*