EUROPEAN SOY MONITOR

Insights on the European supply chain and the use of responsible and deforestation-free soy in 2017

the sustainable trade initiative

IUCN National Committee of The Netherlands

About this report

This report has been commissioned by IDH, The Sustainable Trade Initiative and IUCN NL, the Dutch national committee of IUCN. The underlying research was conducted in late 2018, early 2019. As 2018 data was not yet consistently available, the analysis is largely based on data from 2017. This report was researched and written by Barbara Kuepper and Michel Riemersma of Profundo. To reference this report: IDH and IUCN NL (2019) European Soy Monitor. Researched by B. Kuepper and M. Riemersma of Profundo. Utrecht and Amsterdam: The Sustainable Trade Initiative and IUCN National Committee of the Netherlands.

About IDH, The Sustainable Trade Initiative

IDH, The Sustainable Trade Initiative is an international organization that convenes, finances and manages large programs to accelerate transitions toward sustainability in partnership with multinational and smaller companies, governments and civil society. Headquartered in the Netherlands and funded by different governments and foundations, IDH delivers scalable, economically viable impact on the Sustainable Development Goals. IDH operates globally in 12 different industry sectors ranging from coffee and tea to cotton and soy and encourages joint investment in innovative models to realize long-term solutions for environmentally and socially sustainable production and trade.

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About IUCN National Committee of the Netherlands (IUCN NL)

IUCN NL is the Dutch national committee of the International Union for the Conservation of Nature, the world's largest and most diverse environmental network. Greening the economy is one of its key topics. Stimulated by its partners in Latin American producing countries, IUCN NL has been advocating for responsible soy over the past 15 years as an active member of the Dutch Soy Coalition (publisher of the Dutch Soy Barometer). In partnership with the government, IUCN NL convenes the new multi-stakeholder Dutch Soy Platform Initiative connected to the Amsterdam Declaration Partnership, and advises civil society organizations, government, business and finance on issues of agrocommodity governance.

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CHOOSING RESPONSIBLE SOY

Insights on the European use of responsible and deforestation-free soy in 2017

22% OF SOY USED FEFAC SSG COMPLIANT & 13% DEFORESTATION-FREE

% FEFAC SSG Compliant | % Deforestation free

Finland, 129 MT
66% | 66%

Sweden, 267 MT
37% | 37%

Norway, 657 MT
80% | 80%

Denmark, 1,556 MT
29% | 20%

Germany, 4,192 MT
45% | 16%

Netherlands, 2,481 MT
83% | 50%

Belgium, 1,122 MT
46% | 43%

UK, 2,725 MT
37% | 14%

France, 3,709 MT
19% | 6%

Switzerland, 303 MT
82% | 82%

Portugal, 907 MT
6% | 0%

Spain, 5,173 MT
1% | 0%

Italy, 4,330 MT
3% | 3%

*Deforestation free = certified by RTRS, ISCC +, Proterra, Danube / Europe Soy, CRS / BFA and SFAP-Non Conversion

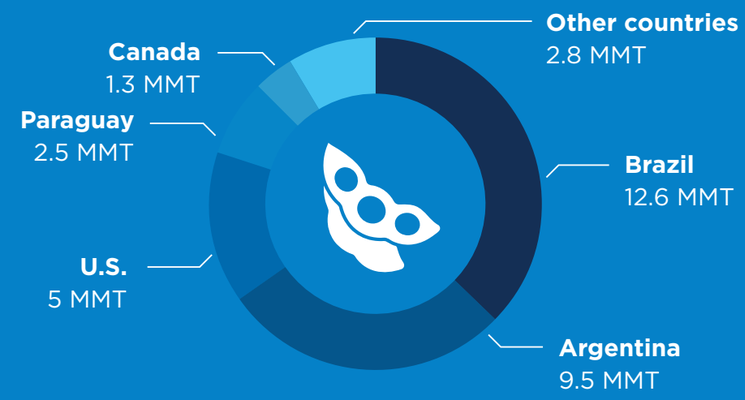
GLOBAL SOY OVERVIEW

337 MMT
global soy production

127 M
hectares total production

19.4 MMT
of this is FEFAC SSG compliant soy

KEY COUNTRIES OF origin OF SOY IMPORTS TO EU+



MILLION TONNES USED FOR FEED, FOOD & BIOFUELS IN THE EU+

		Food Use	Technical use	Feed Use	Biodiesel	Other uses
Soybeans	MT	241				696
Soymeal	MT			30,885		
Soybean Oil	MT	1,325	228		628	176

34.4 MMT
Total use EU+

22% of soy used in Europe is compliant with the FEFAC Soy Sourcing Guidelines and 13% is deforestation-free.

Executive summary and analysis

In this report, we provide insights on the use of responsible and deforestation-free soy in the EU-28 member states, Norway and Switzerland (EU+). As the second largest importer of soy, Europe has a responsibility to solve the sustainability issues connected to its soy consumption.

In 2017, the EU+ used an estimated 34.4 million tonnes of soybeans, soymeal and soybean oil, or 40.5 million tonnes of soybean equivalents- approximately 12% of global soybean production.

By conservative estimates only 7.6 million tons (22%) of this total use in Europe was compliant with the FEFAC Soy Sourcing Guidelines (SSGs), a baseline for responsible soy. Only 4.5 million tons (13%) can be considered deforestation-free according to the draft benchmark mentioned in the text box, covered by RTRS, SFAP-Non Conversion, ProTerra, Danube/Europe soy, ISCC+ and CRS.

The seven Amsterdam Declaration Partnership countries, on which this report focuses, used 19.7 million tonnes of soy. Of this total, an estimated 33% was responsible and 17% was deforestation-free according to the definitions above. The countries vary greatly in their adoption of sustainable soy, from Norway at 80% deforestation-free (ProTerra, RTRS) to Italy at below 3% responsible.

Northern European countries demonstrate higher percentages of responsible and deforestation free soy. Largely thanks to pressure from civil society organizations and support from governments, the feed and dairy sectors have stepped up to the plate. In Italy, Portugal and Spain there is virtually no demand for responsible soy, despite high soy use (combined these countries account for 30% of European soy use in 2017). In France, attention to sustainable soy is increasing due to political attention and the establishment of a multistakeholder feed platform, Duralim.

IUCN NL BENCHMARK & LEGALITY STUDY

Parallel to this monitoring report, IUCN NL commissioned two other studies:

- A benchmark on the conversion and biodiversity requirements of the FEFAC SSG compliant standards and their level of assurance. 8 (in practice 6 a) out of the 17 reviewed SSG compliant standards are deforestation-free according to the draft benchmark: RTRS, ISCC +, Proterra, Danube /Europe Soy, CRS / BFA and SFAP-Non Conversion. These standards account for the 13% mentioned above. RTRS and ISCC+ (7% of European soy use) attain above 80 % of the level of assurance criteria set by the benchmark. Deforestation-free standards tend to (but not all) have a stronger level of assurance than those requiring legal compliance only (Profundo benchmark last draft April 2019).
- A study on the amount of potential legal deforestation. Legally about 110 million hectares can still be deforested in Brazil, Argentina and Paraguay. This figure assumes 100 % legal compliance, which is actually not the case.

IUCN NL argues for the stronger adoption of deforestation-free standards with sufficient level of assurance for both legality and sustainability. For more information, visit the IUCN NL website.

a) Danube & Europe Soy, as well as CRS & BFA can be considered the same

Experts indicate that increases in responsible soy sourcing in recent years can be partially attributed to the demand for non-GM. Especially in Germany, being a large soy user (4.2 milllon tonnes), Proterra covers a large part of their responsible soy. Too often, non-GM is perceived as being more sustainable than GM. Without an accompanying responsibility scheme such as Proterra or Danube soy, there are no guarantees that non-GM soy is produced in a sustainable fashion.

The FEFAC SSGs are used as a baseline for responsible soy in this report. While the end goal in Europe remains high – for many stakeholders this is zero-deforestation soy – the figures in this report show we are far removed from the 2020 zero deforestation commitments. The FEFAC SSGs allow producers to take a road of continuous improvements towards more robust schemes; as it is not realistic in all production environments to demand best in class from the start, and producers need support to get there. As such, the FEFAC SSGs enable a mainstream transition to responsible soy on the ground, thereby working towards more mass, which will make physical sourcing models possible. Meanwhile, deforestation-free options can be actively supported by market parties and importing countries to gain more foothold on the ground.

The producer must be (financially) incentivized to invest in responsible production. Total production of FEFAC Compliant responsible soy is conservatively estimated at 19.4 million tons in 2017, with production in South America accounting for 6.8 million tons, and the US for 11.6 million tons, with the remainder for Europe. Figures from RTRS show that production in 2018 reached 4.5 million tons, while credit sales were at 2.8 million tons. In 2017, production was 4 million tons, so in one year's time there was an increase of 500.000 tons, while producers knew very well that their credit might not be sold. Other schemes show similar, though less dramatic, figures. Supply is clearly not a bottleneck for increasing the percentage of responsible soy.

This report has been developed as a tool to drive the uptake of responsible soy in Europe; as demand for responsible soy is key to driving responsible production. Only by knowing where we stand, will we know where to improve. This report has shed some light on the status.

A more in-depth analysis of the percentages of the various FEFAC-SSG compliant standards in European supply chains is at this stage hampered by the lack of transparency and unclear data – while transparency delivers insight on how to progress towards deforestation-free and responsible soy.

The report does clearly demonstrate that the uptake of responsible soy is too low, despite the efforts in the past years. A great many commitments have been signed, working groups started – but the impact seems to be too marginal to date. The demand for sustainably produced soy needs to increase dramatically, and new sustainable sourcing solutions need to be developed. To improve, besides working on a more transparent supply chain, we support the following step wise pathways:

Buying credits of the schemes that offer them is a first, obvious element, preferably as a regional certificate/ area mass balance. End users such as retailers can cover their use with credits or ask their suppliers to do so, and ensure they are properly compensated. RTRS production in the Brazilian states of Maranhão and Piauí has helped the region in its sustainable development, for example. IUCN NL and partners promote the uptake of deforestation-free standards with good level of assurance in markets in Europe, aiming to expand the geographical coverage of deforestation-free responsible soy in producing countries.

A second element is to ask suppliers to source soy with increasing sustainability requirements from a certain region. To ensure a link with your supply chain, a footprinting exercise can be done – from which traders do most of your suppliers buy their soy, and where do they source from? From the footprinting exercise that 4 UK retailers did in 2017, a key result was that 2 traders sourced 57% of the soy for eggs, meat and dairy. Only sourcing from regions where there are no problems is not the answer, we need to support continuous improvement. By asking suppliers to source from regions, continuous improvement in these regions will be promoted. IDH, The Sustainable Trade Initiative is working on a new sourcing mechanism called Verified Sourcing Areas, providing a solution for sourcing sustainable soy at a competitive scale and price. By creating a direct link between sourcing areas and end buyers committed to sustainability, this model allows the market to directly support local actors to achieve sustainable production.

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Abbreviations

ABIOVE	Associação Brasileira das Indústrias de Óleos Vegetais (Brazilian Association of Vegetable Oil Industries)
ADP	Amsterdam Declarations Partnerships
Aprosoja	Associação dos Produtores de Soja e Milho de Mato Grosso (Association of Mato Grosso Soybeans and Maize Producers)
CGF	Consumer Goods Forum
EU+	EU-28 Member States plus Norway and Switzerland
EU+intra	Trade between the group of EU+ countries
EU+extra	Trade with countries outside the group of EU+ countries
FMCG companies	Fast moving consumer goods companies
FAME	Fatty-acid mono-alkyl esters (biodiesel)
FEDIOL	European Vegetable Oil and Proteinmeal Industry Association
FEFAC	European Feed Manufacturers' Federation
FEFAC-SSG	Soy Sourcing Guidelines developed by FEFAC
GM-soy	Genetically modified soy
GPP	Green Public Procurement
GTC	Cerrado Working Group
HCS	High Carbon Stock
HCV	High Conservation Value
ILUC	Indirect Land-Use Change
INPE	Brazilian National Space Research Institute
IP	Identity Preserved
ISCC	International Sustainability and Carbon Certification
JRC	Joint Research Centre of the European Union
PPCerrado	Action Plan to Prevent and Control Deforestation in the Cerrado Biome
PPCDAm	Action Plan to Prevent and Control Deforestation in the Legal Amazon
RTRS	Roundtable on Responsible Soy
SBC	Soy Buyers Coalition
SCF	Soft Commodities Forum
SPC	Soy Protein Concentrate
SSG	Sustainable Sourcing Guidelines developed by FEFAC

Preface

Soybeans are the world's most efficient source of protein per hectare. The role of soymeal as a key protein source in livestock feeds led to a rapid increase in the cultivation area globally, reaching 124 million hectares in 2017/18. In the major producing countries in South America, soy cultivation has supported the economic development of many rural areas, but also has had a high environmental and social price.

The European Union, Norway and Switzerland (EU+) use 34.4 million of tonnes of soybeans, soybean meal and oil annually, or 40.5 million tonnes of soybean equivalents. This equals approximately 12% of the 337 million tonnes produced globally in 2017. Most of this is used as animal feed for livestock products such as meat, dairy and eggs. Europe, as the second largest importer of soy after China, has a responsibility to solve the sustainability issues connected to its soy consumption.

In this first responsible and deforestation-free soy data report, we map the soy supply chain in the EU+ countries. We identify the share of soy that has been certified under the FEFAC Soy Sourcing Guidelines (FEFAC-SSG) compliant schemes and more specifically what share originates from deforestation-free cultivation. Special attention is given to the seven signatory countries of the Amsterdam Declarations who committed to preserving primary forests and high conservation value areas through responsible supply chain management.

The overall outcome of our analysis is not positive. With less than 2 years until the end of 2020, only 22% of EU+ soy use is responsible (i.e. FEFAC-SSG compliant), and only 13% can be considered deforestation free (RTRS, ISCC +, Proterra, Danube / Europe Soy, CRS / BFA and SFAP-Non Conversion). At this stage of market development, soy is largely not traceable to origin. Physical sourcing models are often considered too expensive due to lack of mass, meaning there is simply not enough compliant soy to separate it from the rest.

Increasing actual demand for responsibly produced commodities is essential to supporting the transition of mainstream soy imports towards responsible production, and to fighting deforestation. Therefore, we call upon the private sector, governments and NGOs to step up action to achieve this goal.

Manufacturers, brands and retailers need to be at the forefront of this drive; purchasers must source responsible soy that matches sustainability and/or zero deforestation commitments. All players must put responsible soy in sourcing requirements, actively ask suppliers to deliver sustainable products, and help them do so.

Trade and crush need to step up the ongoing efforts to increase the traded volumes of responsible soy, stop sourcing from illegally deforested areas, and improve transparency.

The Feed sector must map where the soy is coming from, and work with buyers and suppliers to integrate responsible and deforestation free soy into the supply chain flow from farm to fork.

Governments need to step up, implementing public procurement and policy/regulation that support companies and farmers in making this shift towards responsible and deforestation-free production and import. All countries must engage at the highest level in a dialogue with the private sector and producing countries to identify bottlenecks and find solutions, and support farmers and governments in soy production regions with investments in responsible production.

Civil society needs to increase dialogue with supply chain partners and consumers to promote sustainability, focusing on awareness raising, fair reporting, and policy development.

Financial institutions play an essential role in demanding responsible production and sourcing from clients and providing financing to producers to improve their practices, and restore forests and other ecosystems.

Though progress has been made, we will not achieve the 2020 targets. In the next 2 years, all industry players need to work together to support farmers and governments in the transition towards responsible soy. Sustainable buying commitments, loans, technical assistance and diplomacy will all support this shift. These shifts must be implemented on the farm level, on a regional level, and very importantly, at the market level in Europe.

The market needs to move. We have less than 2 years to show that Europe is abolishing (illegal) deforestation from its soy value chain and is an active and engaged stakeholder in the fight against deforestation. It is only through a surge in our combined efforts that we will achieve an industry-wide shift.

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Director IUCN
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01 Methodology

1.1 SCOPE

This report provides a snapshot of how industry stakeholders, authorities and civil society in the EU-28, Norway and Switzerland (EU+) are faring in their goals of disconnecting soy imports from negative externalities including environmental and social impacts, and supporting the growth of agricultural best practices and adoption of conservation measures in production countries. It aims to establish what share of soy used in these European countries, and specifically in the Amsterdam Declarations Partnership (ADP) countries, is compliant with the Soy Sourcing Guidelines of the Federation of European Animal Feed Manufacturers' Federation (FEFAC-SSG). Given the ambitions of the ADP, the Consumer Goods Forum (CGF) and other groups to develop soy supply chains free of any deforestation and conversion, this study also aims to specifically identify volumes compliant with deforestation-free standards (also excluding the legal conversion of forests, wetlands, high biodiversity grasslands or other valuable natural areas which we collectively refer to as as "deforestation-free").

1.2 DEFINITIONS

The following terms and definitions are used in the report:

- Soy: is used as a general term for soybeans and the products resulting from soybean crushing: soymeal and soybean oil. The protein of the meal content differs depending on the growing region and whether the hulls are included in the resulting meal (44% protein meal) or kept separate (48% protein meal ('hi-pro')). The crushing ratio can vary between 73% for high-pro meal and 80% for low-pro meal.[1] In this report, an average crushing ratio of 78.5% soymeal and 18.5% soybean oil is applied.[a] This percentage is also applied in calculating soybean equivalents for the consumption of embedded soymeal (1 tonne of soymeal equals 1.27 tonnes of soybeans required for its production).
- Embedded soy: in Europe, soy is largely used in the form of soymeal in compound feeds for different livestock sectors. This term 'embedded soy' is used to describe the soy needed for the production, trade and consumption of livestock products from animals raised on soy-containing compound feeds.
- Europe; refers to the geographical definition of Europe, thus also including European countries outside of the European Union. This refers, for example, to Switzerland, Bosnia-Herzegovina, Russia, Ukraine or Norway.
- European Union (EU): refers to the current 28 member states of the European Union (EU-28).
- EU+ refers to the EU-28, Norway and Switzerland. EU+ extra refers to countries outside the EU+. EU+ intra refers to countries within the EU+.
- The Amsterdam Declarations Partnership (ADP) countries are Denmark, France, Germany, the Netherlands, Italy, Norway and the United Kingdom (UK).
- With deforestation and deforestation-free, this report refers to the Accountability Framework definitions. The Accountability Framework Initiative has the following definitions of deforestation and deforestation free:

  Deforestation: Loss of natural forest as a result of:
  i) conversion to agriculture or other non-forest land use;
  ii) conversion to a plantation forest; or
  iii) severe and sustained degradation.

  Deforestation-free (synonym: no-deforestation): Commodity production, sourcing, or financial investments that do not cause or contribute to deforestation of natural forests.

  In this report, 'deforestation free' refers to soy covered by FEFAC SSG Compliant standards that require deforestation free production. These standards do not allow any type of deforestation. The standards with a 'deforestation free' provision were identified in the benchmark "Setting the bar for deforestation free soy in Europe" (Profundo, draft April 2019). According to the benchmark, the other standards also have requirements that are relevant to combat deforestation and to protect biodiversity, however these standards do not have stringent deforestation policies that explicitly prohibit also any "legal deforestation".

1.3 DATA USED IN THIS STUDY

1.3.1 Soy on the European market

Important parts of this study rely on trade statistics, both trade between EU+ countries and third countries (EU+ extra trade) as well as trade among EU+ countries (EU+ intra trade). Several leading statistical sources were consulted in order to match figures, and to identify and correct for discrepancies.[b] As 2018 data is not yet available in full, trade and production data for the year 2017 is used for analysis. Reference to 2018 data is made where remarkably deviant.

European countries import large volumes of soy, in the form of beans, meal and oil, for processing and consumption. In addition, several of them also function as important transshipment hubs, meaning that a portion of the imports is re-exported. Imported beans, meal and oil, which entered Europe through major entry ports like Rotterdam or Hamburg may be directly re-exported. Similarly, a portion of soybeans may be crushed in the importing country, and re-exported as resulting soymeal and soybean oil.

a The remainder is accounted for by hulls and waste.

b Eurostat, USDA, ITC Trade Map, statistical offices in EU+ countries, ISTA Mielke.

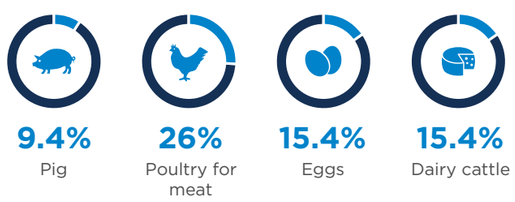
In order to identify the volumes of soy available for processing in the EU+ as well as in individual countries, the reported re-exports of soybeans, -meal and -oil are deducted from the sum of imports, crushing volumes and, where applicable, production. The volumes are then assigned to different sectors. Overall, not enough detailed and reliable data can be drawn from industry disclosures on soy sourcing, processing, and consumption. The data used in this report are the best available approximates available to create a model of the EU+ soy distribution and consumption. This report is an annual exercise, and we aim to improve the quality and quantity of data each year.

1.3.2 Soy processed in animal feed and food products

The resulting volume of available soymeal is assumed to be 100% used as feed by the livestock industry of the country. As international trade in compound feed is comparatively small, it is also assumed that these feeds are consumed exclusively by domestic livestock industries.

Statistics on overall compound feed production in EU+ countries are annually published by FEFAC. No comprehensive dataset on animal feed composition across all EU+ countries that covers all relevant types of livestock has been identified. Wageningen University & Research (Netherlands) calculated estimates for the average compositions of animal feeds for five important livestock types in ten EU-countries in 2016 (Figure 1).[2] These are based on a 2014 study conducted in the Netherlands and corrected for differences in feed efficiency and soy content in feed by country and product.[3] Estimates from these two studies in combination with additional data on the composition of aquaculture feed in the case of Norway are used as best estimates of animal feed composition. For Norway and the EU+, weighted averages of the data from the ten countries are applied. The calculation of soymeal shares based on confidential data provided by a selection of animal feed producers and experts may contain under- or overestimations of actual use of soymeal in feed.

Figure 1 Estimated soybean meal content in animal feed, Europe



Soy Footprint of Animal Products in Europe – An Estimation, Research commissioned by IDH, Wageningen, Netherlands: Wageningen University & Research, p. 5.

The different ratios of soymeal in feed are used to distribute the volume of soymeal available for domestic processing (as drawn from statistical databases) across the feed volumes produced for different types of livestock (as reported by FEFAC).

Due to a lack of data, home mixing on farms cannot be separately considered. Correction factors are applied for countries where the volumes do not match.

Some soymeal is also processed into fish feed, but detailed data on the trade and consumption of farmed fish is not available, as statistical databases make no distinction between imports and exports of farm-raised and wild-caught fish. The availability of figures on fish feed production is also very limited. These data limitations constrict the ability to make reliable estimates for soy volumes embedded in fish trade flows or the country-level consumption of fish from aquaculture. An exemption is made for Norway where the aquaculture industry is the leading consumer of soymeal and better data is available.

Based on soymeal use in domestic livestock production and net exports of embedded soy in imports and exports of livestock products, the actual domestic soymeal consumption of each country or region is estimated.

Regarding the use of soybeans and soybean oil in food products, data availability on the level of individual countries is too limited to allow for statements on volumes processed and consumed per country. However, the share of direct use of soybeans and soybean oil in food products accounts for only a small share of overall soy consumption in EU+ countries.

1.3.3 Soy used in biodiesel

Detailed data on biodiesel feedstock is not consistently available across EU+ countries. However, different analyses suggest that soybean oil is only used in few EU+ countries as feedstock in biodiesel production, and in those cases only represents small shares of overall feedstock consumption.

As there is frequent intra-European trade of biodiesel, biodiesel production is not equivalent to biodiesel consumption when looking at feedstocks. With the revocation of import tariffs on Argentinian biodiesel in late 2017 (see section 3.2.3), increasing volumes of soybean oil-based biodiesel have been imported to the EU+, largely entering through a few large ports. Where countries do not publish detailed statistics on feedstocks used in biodiesel consumption, it is difficult to estimate the country-level consumption of soybean oil for biodiesel.

1.3.4 Responsible soy streams

In this report, only soy that has been benchmarked with the FEFAC SSGs is taken into account.

Information on volumes of responsible soy imported by EU+ countries is not registered through customs data. Mapping of these streams relies on disclosures by soy buyers and by the relevant bodies administering the standards and programs. The level of transparency differs widely, with RTRS taking the lead in publishing annual updates providing detailed data on production, sales and buyers.

The relevant bodies administering the standards and programs were contacted with requests for information on certified volumes, the share that has been sold under certified labels, and the destination countries. Not all involved stakeholders could or would provide information, partly justified by claims of insufficient data, and in some cases confidentiality issues.

Furthermore, leading importing and processing companies related to the livestock sector (animal feed, meat, dairy, eggs) and industry associations in key EU-countries were contacted with the request to fill in a questionnaire detailing their soy consumption and volumes of compliant soy broken down by scheme in 2017 and 2018. This has largely resulted in the presented, estimated percentages. However, responses to these requests were insufficient to be able to map flows of certified soy to and within the EU+ and key sectors. The conclusions drawn in this study are thus limited by the fact that no full overview is available. In sum, the percentages presented in this report are based on the limited data that was available. As this report is the first of a series of annual reports, the data quality is expected to improve in the future.

FEFAC provided results from a survey conducted among its national member organizations from May 2018. As not all members answered, the results give partial figures on the soy use and share of compliant soy in compound feed in EU+ countries in 2017. Most notably missing is Central Europe.

FEDIOL, the EU vegetable oil and protein meal industry association that represents the interests of the European oilseed crushers, vegetable oil refiners and bottlers companies, has agreed to set up a system to monitor the volumes of compliant soy used in the EU, with preliminary results expected in the first months of 2019.[4]

02

Soybeans – the largest global protein crop

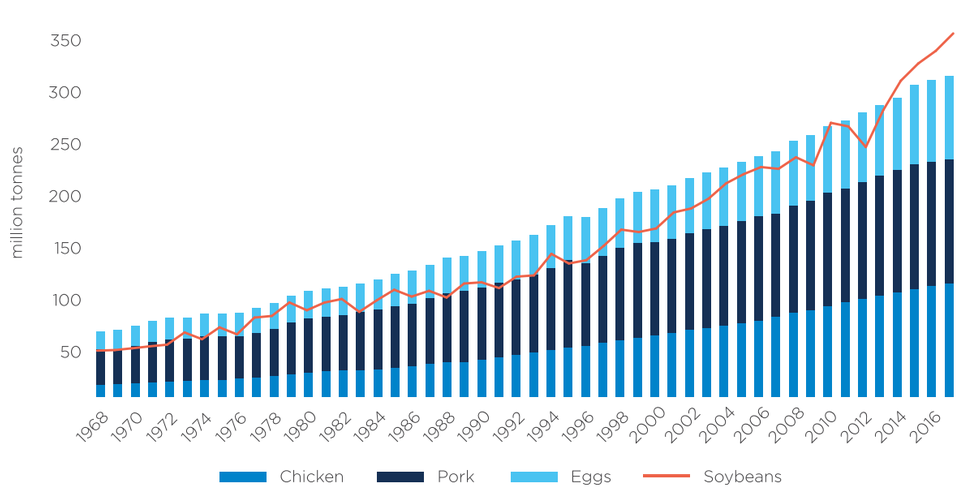
2.1 VERSATILE AND EFFICIENT PROTEIN CROP

The cultivation of soybeans has been one of the biggest success stories of agricultural commodities in terms of production and volumes traded globally. Soybeans are grown in temperate, subtropical and tropical climates. Production systems range in scale from large industrial farming operations in South America that grow soybeans on more than 100,000 hectares, to small farmers with plots between 1 and 50 hectares. Most of the production is concentrated in North and South America. Production in Asia and moderate European climates (notably Ukraine, Russia, Italy, France) is much smaller, albeit increasing. China is the most important customer for soy globally, followed by the EU-28.

While hardly visible in the supermarket shelf, soy is directly and indirectly used in many processed food products. Direct soy products include soy milk and tofu, and fermented soy products like soy sauce. Indirect soy use is largely confined to livestock products that have no physical presence of soy in end products (i.e. meat, dairy, eggs or farmed fish), and is referred to as 'embedded' soy in the supply chain. Around 85% of the global soybean harvest is 'crushed', resulting in around 78.5% soybean meal (also called oilcake) and 18.5% soybean oil as the main products (see Figure 2). The soybean oil resulting from the crushing process is largely used as refined cooking oil, in margarines, dressings and for other food purposes (around 82%). The remainder is used for industrial and chemical purposes such as biodiesel (18%), soaps and fatty acids.[5] Virtually all the soymeal resulting from crushing is used in livestock feed, and uncrushed beans ('full-fat soybeans') make up just a small share of soy in animal feed.

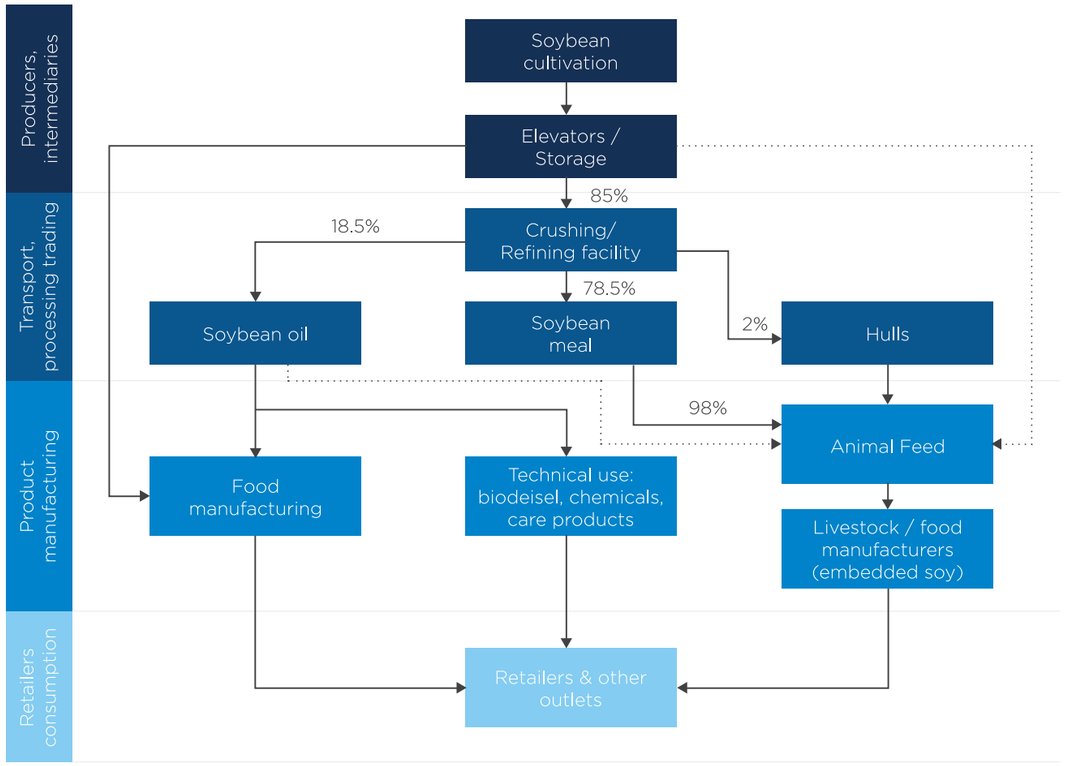
In comparison to other protein crops, soy is the world's most efficient source of protein per hectare. This attribute makes it an important staple for animal feed. In 2017/18, soymeal accounted for 65.8 percent of global oilseed meal output. Continuing increases in the consumption of meat, dairy and eggs globally has been a key driver in the growing demand for soy in recent decades. (Figure 3).[6]

Figure 2 Development of global chicken, pork, egg and soy production, 1968-2017 (million tonnes)



Source: *FAOStat* (n.d.), "Production: livestock primary & crops"

Figure 3 Simplified soy value chain



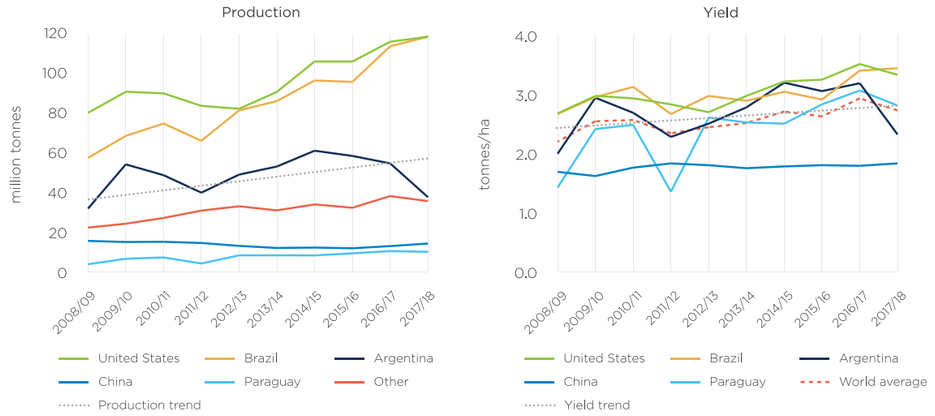
2.2 DEVELOPMENT OF GLOBAL SOY PRODUCTION

Global soy production has shown continuous growth during the last 10 years, from a total of 212 million tonnes in 2008/09 to 337 million tonnes in 2017/18. Total landmass dedicated to soy production was 97 million hectares in 2008/2009 and 124 million hectares in 2017/2018. Though the general trend has been increased global production, the volatility of agro-commodity production is reflected in variation in individual countries' production in any given year (Figure 4). An example for this is the steep production decline in Argentina in 2017/18, caused mainly by a severe drought and unusually high temperatures during the summer months.

Intensification and improved production methods led to overall continuous increases in yields during the ten-year period. Among the largest soy producing countries, the U.S. and Brazil have achieved the strongest yield increases. Argentina and Paraguay show greater year-to-year variations, while the development in China remained almost flat (Figure 4).

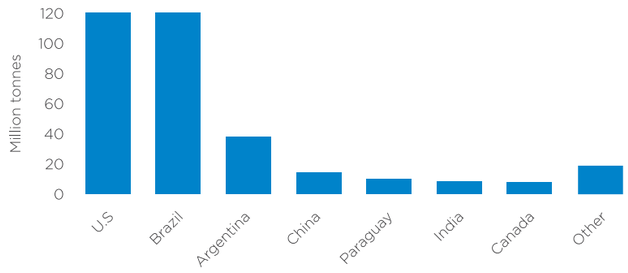
The U.S. and Brazil are the top-producers, each accounting for 35.5% of global production in 2017/18. Argentina remains the third largest producer despite significant production reduction in recent years.

Figure 4 Soy production and yield in key countries, 2008/09 to 2017/18 (million tonnes and tonnes/hectare)



Source: USDA Foreign Agriculture Service, "Production, supply & distribution online - Custom query"

Figure 5 Top-10 soy producers 2017/18



Source: USDA Foreign Agriculture Service, "Production, supply & distribution online - Custom query"

2.3 GLOBAL SOY TRADE

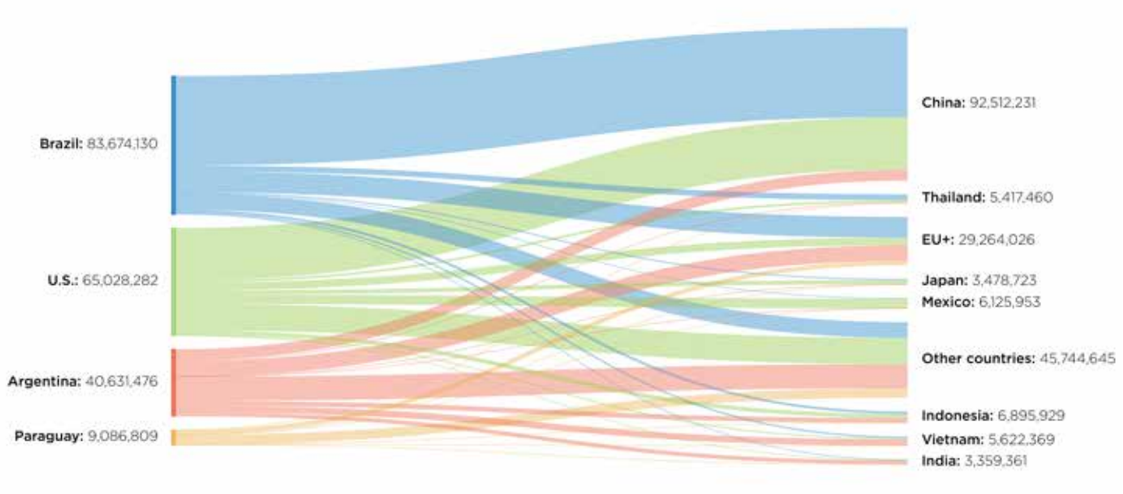
Soy is one of the most widely traded crops globally. The top exporters of soybeans, -meal and -oil are Brazil, the U.S., Argentina and Paraguay. Together these four countries accounted for 91% of globally traded soy products in 2017.[7] Depending on national processing capacity and tariff structures, the share of beans, meal and oil exported per country can differ considerably.

Figure 6 illustrates the physical soy flows between the four key exporting countries to the most important importing countries in 2017. It shows China's dominating role a soy consumer, accounting for around 42% of soy traded globally. China imports almost exclusively soybeans, which are then crushed domestically. The protein-rich meal is used in its ever-growing livestock production, mainly as feed for pigs and chickens.[8] Soybean oil is the most important vegetable oil consumed in China.[9] Domestic Chinese soy production decreased from 15.8 million tonnes in 2008/09 to 12.4 million tonnes in 2015/16, however, it has recovered since then to 15.2 million tonnes in 2017/18 and is expected to further increase. China's domestic soy production remains far too insufficient to fulfill the demands of the Chinese livestock sector.[10] The majority of the domestic Chinese soy production is used for food products such as tofu and soy milk thanks to its GM-free status.[11]

The soy trade as presented in Figure 6 has changed considerably over the course of 2018 due to the escalating trade war between the U.S. and China. In July 2018, China applied a 25% tariff on U.S. soybeans as a reaction to punitive tariffs imposed earlier by the U.S. In previous years the U.S. supplied about one third of China's soy imports, and as a result China has begun to look for alternative supplies from other soy producing countries, namely from Brazil, but also Paraguay and Argentina.[12] Prices for Brazilian soybeans increased as demand surged, but for Chinese importers the tariff-free Brazilian soybeans were still cheaper than imports from the U.S.[13] At the same time, Chinese demand for soy weakened in comparison to previous years, partially due to an outbreak of African Swine Fever.[14] In addition, the Chinese pork sector started taking steps to cut its comparatively high soymeal ratios in pork feed, a strategy that could reduce import needs by an estimated 27 million tonnes (around 25%) annually.[15]

Meanwhile, U.S. exporters on short notice had to find other export markets. Prices for U.S. soybeans hit a ten-year low in July 2018.[16] Figure 7 illustrates the changes in U.S.-soybean trade flows in the first three months of the marketing years 2017 and 2018, respectively. Larger volumes of U.S. soybeans than in previous years were exported to other Asian countries. In addition, the slump

Figure 6 Key export destinations for soy from leading exporting countries, 2017



Note: depicting total streams of soybeans, -meal and -oil.
Source: *ITC Trade Map* (2018), "List of importing markets for a product exported by Argentina/Brazil/Paraguay/United States"

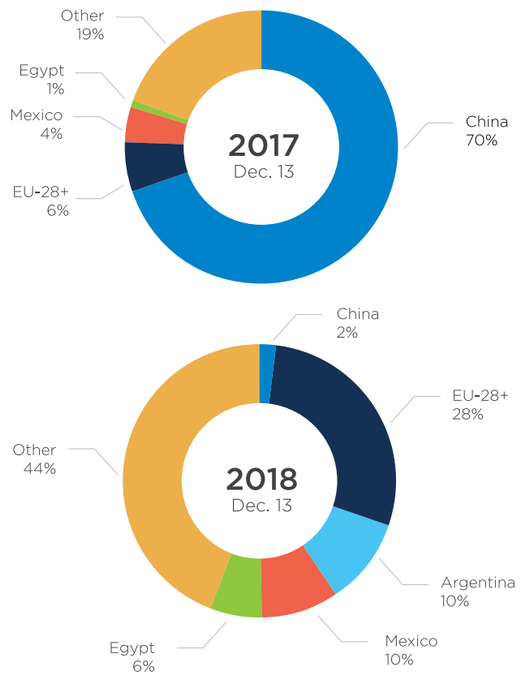
in price and abundant availability of U.S. soybeans in combination with Argentina's severe harvest losses caused by a persistent drought meant that Argentina, normally one of the top soy exporters, purchased 1.4 million tonnes of U.S. soybeans until end of November 2018 to feed its crushing industry.[17]

U.S. soybean imports to the EU were up by 99.2% in the first 22 weeks of the marketing year 2018/19 compared to the same period in 2017 (in the context of an overall EU increase of imports year-on-year by 9%). Meanwhile, imports from other countries, namely Brazil, Paraguay and Canada, decreased significantly.[18] However, as the EU imports more soymeal than soybeans, and mostly imports soymeal from South America, the increase in sourcing soybeans from the U.S. appears less drastic when both soy products are considered.

When this situation will change again remains unpredictable. Trade talks between the China and the US continue.[19] In the medium-term, it is expected that China will likely aim to reduce its current dependence on imports of US agricultural commodities. This could be achieved by boosting imports from other countries, while also incentivizing domestic soybean production and cutting back on protein ratios in feed. However, climatic constraints and finite availability of suitable land limit the expansion possibilities for domestic production. Meanwhile, the US has announced market facilitation programs and funding to explore new export markets such as India and Pakistan.[20]

Such a sudden change in trade relationships caused by policy changes illustrates the volatility of agro-commodity markets. It also shows that imports are to a large extent price-driven and short-term, and less tied to particular zones or producers under long-term sourcing contracts, which at this point remain an exception.

Figure 7 Distribution of accumulated export sales of U.S. soybeans in first 4 months of marketing years 2017 & 2018



Source: USDA Foreign Agriculture Service (2018, December), "U.S. export sales: complete weekly report

2.4 SUSTAINABILITY ISSUES IN THE SOY VALUE CHAIN

Soy is one of the key drivers of regional economic growth in Argentina, Brazil and Paraguay. In addition to the direct economic activities of soy cultivation, it has resulted in significant positive gains in various socioeconomic features, such as non-agricultural GDP and employment in sectors like services, commerce, construction, education and health. In Mato Grosso, Brazil, soybean producing areas are associated with higher human development indices, higher median incomes, better schools and lower poverty rates. It is estimated that around 45% of the non-agricultural GDP growth and more than 50% of the employment in non-agricultural sectors are tied to Mato Grosso's soybean industry. In Argentina and Paraguay, soy industry also contributes to the country's annual GDP growth and benefits other sectors, such as finance, building and commercial.

However, the success of the soybean industry has come at a price, as it is connected to a range of environmental and social sustainability issues in producing countries. Appropriate safeguards in public policies as well as private production and sourcing criteria are often absent. The following sections describe some of the sustainability issues connected to soy cultivation in North and South America.

The disappearing North American grasslands

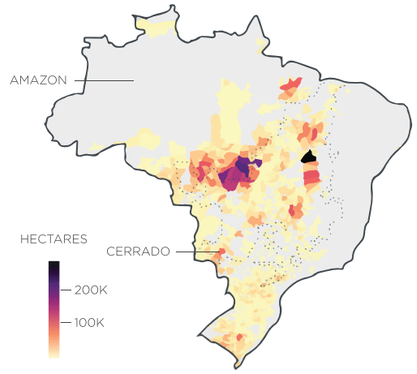
According to the WWF, temperate grassland ecosystems as found in the U.S. and Canada are the least protected biomes globally. While less prominently reported on, farmland conversion for the cultivation of wheat, soy, maize and other crops also contributed to a significant loss of the biodiverse and carbon-rich temperate grasslands in North America, with rates comparable to tropical deforestation in the 1980s and 1990s. In 2017 alone, almost 690,000 hectares of grassland were lost in the U.S. Great Plains. While expected to still function as a carbon sink in the coming decades, a tipping point could eventually be reached if the remaining fragments of tallgrass prairie are converted at current rates.[299]

2.4.1 Deforestation and conversion of natural ecosystems

Deforestation and conversion of natural ecosystems in South America has been driven by the rapidly growing landmass dedicated to soy cultivation in South America, directly connected economic activities, and indirect land-use change (ILUC) through the displacement of other agricultural activities.[21] Besides causing biodiversity loss, land use change for agriculture and forestry are key contributors to greenhouse gas emissions.[22]

Soy cultivation was for many years one of the key drivers of deforestation in the Brazilian Amazon. While forest loss in the Amazon remains a concern, the interrelation between Amazon deforestation and soy expansion has been substantially weakened as a result of the Amazon Soy Moratorium introduced in 2006 (see section 2.5.2).[23] Additionally, large parts of the Cerrado biome, a highly biodiverse forested savannah with an important role for carbon sequestration and the region's hydrological balance, have been converted to agricultural use during the last decades. Soybeans have been a key driver of that conversion. In recent years, Brazil's agricultural frontier has continuously moved into the less developed areas of the Cerrado (Figure 8).[24]

Figure 8 Soy expansion in Brazilian Cerrado and Amazon, 2005 to 2016



Trase.Earth (2018), "Yearbook 2018 – 6. Zero deforestation commitments and Brazilian soy".

Table 1 Estimate on South America average % of soy expansion onto forested areas

2008-2017	Brazil	Argentina	Paraguay	Uruguay	Bolivia
% of South American soy expansion	67%	19%	7%	5%	2%
% onto forested land	10.4%	9%	57%	1%	60%
South American average % onto forest	14%				

Source: JRC, In: European Commission (2019), *Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Status of Production Expansion of Relevant Food and Feed Crops Worldwide (Draft),* Brussels, Belgium: European Commission, p. 21.

The expansion of farmland has also been a key driver of large-scale deforestation in the Gran Chaco bioregion, a highly biodiverse dry forest extending from Brazil into Argentina, Paraguay and Bolivia.[25] Over the last two decades, the Chaco forests have seen some of the world's highest land conversion rates, with soybean cultivation and cattle ranching as key economic drivers.[26] Deforestation in the Argentinian Chaco is estimated to affect more than 500,000 hectares of natural vegetation per year, much of it used for soy cultivation.[27] In Paraguay, the Upper Parana Atlantic Forest has been at the heart of soy cultivation expansion, leaving only ~10% of its original ecosystem intact.[28] In the last decade, soy expansion in the eastern part of the country has largely converted existing grassland to soy production, displacing the livestock sector to the Chaco biome in the western part of the country.[29]

Keeping in mind the limited data availability, calculations by the Joint Research Centre of the European Union (JRC) across five producing countries for the period 2008 to 2017 suggest that 14% of total soy expansion was onto previously forested lands, with Bolivia and Paraguay showing the highest shares at 60% and 57% respectively. In Brazil this share was calculated at 10.4% (Table 1). For other countries with high soy expansion rates since 2008 - India, Ukraine, Russia, Canada - no evidence for a link between soy cultivation and direct deforestation could be found.[30]

To satisfy the ongoing increase in global soy consumption, significant additional conversion to cropland is projected in the coming years. Brazilian production is expected to reach 129 million tonnes by 2027, an increase of around 10% from 2017 levels.[31] There are concerns that this may lead to further deforestation. Meanwhile, there is broad consensus that Brazilian crop production can be increased through the use of large areas of already deforested or degraded lands in the Amazon and Cerrado regions.[32]

2.4.2 Resource consumption and degradation

Intensive soy cultivation consumes large amounts of resources like water, soil, fuel, fertilizers and pesticides. While high soil erosion rates associated with soybean cultivation have been reduced in recent years through methods like conservation tillage, they are still at an unsustainable level, and lands classified as 'highly erodible' are still in use for soybean cultivation. Due to the high mechanization level, soil compaction is another concern on large soy farms.[33] Short-term land lease contracts, common in Argentina, are a specific concern here as producers have less incentive to maintain soil quality than on owned land.[34]

Applying phosphorus fertilizers has been an integral strategy in increasing crop production, especially on marginal lands with low fertility. The mining of phosphate ores for the production of phosphorus is connected to a range of environmental impacts, including water pollution, air pollution, and human health risks.[35] In addition to the environmental cost of high fertilizer input, phosphorus is a finite resource important in sustaining overall food production and security. It is especially needed when growing crops on marginal lands with low fertility.[36]

The sheer scale of soybean monocultures increases their ecological vulnerability. Growing problems with diseases such as the Asian soybean rust have been observed in all growing regions.[37] The significant increase in the application of pesticides, especially since the introduction of genetically modified soy (GM-soy), is accompanied by increased negative impacts on ecosystems, water quality and human health. Furthermore, it creates significant challenges for farmers through the development of herbicide-resistant 'superweeds' (section 2.4.3). Glyphosate, the active ingredient in the Roundup pesticide that is widely applied on GM-soy, has been at the center of a debate in recent years over direct and indirect health effects on humans, animals and microbial life in water and soil.[38]

2.4.3 GM soy

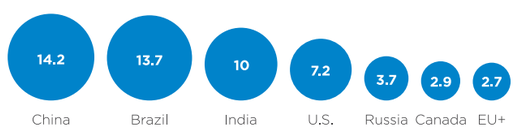
The success of soy as a protein crop expanding into frontier areas that previously were not agriculturally viable, such as the Gran Chaco in Argentina or the Cerrado in Brazil, was accelerated by the introduction of GM-soy under no-tillage systems in the 1990s and 2000s.[39] According to industry-estimates, the area under GM-soy production increased to an approximate 94 million hectares in 2017, 76% of the global soy cultivation area. Notable among the key producer countries were U.S., Canada, Argentina, Brazil, and Paraguay.[40] GM-soy cultivation is banned in EU+-countries, Russia and China.[41] India prohibits GM-soy cultivation but there are reports of illegal seed imports.[42] The Ukraine lacks proper regulation of the import and cultivation of non GM seeds, with insufficient controls and monitoring leading to wide-spread contamination with GM-soy.[43]

Proponents claim that GM-crops allow more efficient farm operations, produce higher yields and reduce pesticide use. Opponents dispute these benefits and point to problematic trade-offs. There is evidence that herbicide-resistant GM crops have led to more frequent applications of weed killers, eliminating weeds with high importance for insects and driving the development of herbicide-resistant 'superweeds'.[44] Falling back on broad-spectrum herbicides as a reaction has further impacts on biodiversity, soil health and water.[45] Claims of higher yields are also disputed. Research by the USDA found that the commercial use of GM-seeds has not fulfilled the promise of increased yields.[46]

The largest producers of non-GM soy globally in 2017 were China and Brazil, followed by India and the U.S. (Figure 9).[47] Premiums for non-GM soy paid in the Brazilian state of Mato Grosso, driven by demand from Europe and China, reached and average of BRL 200 (€ 50) per tonne.[48]

According to Rabobank estimates, around 11% of global production is segregated from GM-beans. Much of this volume is consumed domestically, particularly in China and the EU. That leaves about 9 million tonnes of non-GM soy traded globally in 2017, a 50% increase over three years.[49]

Figure 9 Leading producers of non-GM soy (2017, million tonnes)



Source: Donau Soja Association, in: *APK-Inform* (2018, June 16), "Global soybean market – focus on GM-free soy".

Non-GM certification does not address other negative impacts of soy cultivation on the environment or local communities, such as deforestation or abuse of chemicals. Additional sourcing requirements related to environmental and social performance indicators are provided by certification systems such as Donau Soja / Europe Soya, ProTerra, the Organic standard and the specific non-GM soy modules under RTRS and ISCC certifications (see section 2.5.5).

2.4.4 Impacts on the rights and livelihoods of local communities and workers

Environmental and social issues connected to soy cultivation in South America have been exacerbated by increasing land speculation, where value is generated from appreciation by acquiring land, clearing it of its native vegetation, transforming it into farmland, and selling it off.[50] In the Brazilian Cerrado, large-scale farmland investments have not only led to deforestation but have repeatedly been preceded by land speculators using falsified land titles to illegally lay claim to public lands.[51]

In these cases, local communities and small farmers are often denied access to land that was traditionally used for small-scale farming and hunting.[52] Practices of traditional communities being stripped of their land titles have also been documented in Argentina.[53] In the Brazilian Amazon, data for 2016 showed that at least 24% of deforestation was concentrated on public land that had not been allocated for use.[54]

Illegal practices documented in Brazil include cases of farm labor that is degrading or analogous to slavery.[55] Unlawful labor practices have also been connected to soy production in other emerging production countries like India and China. Furthermore, workers are at risk of being exposed to health and safety hazards beyond legal limits due to a lack of professional training and health and safety guidance.[56]

2.5 SUPPLY-SIDE INITIATIVES

Recognizing the multi-faceted environmental and social issues connected to soy cultivation and the increasing consumer awareness of these issues, various public and private initiatives have been initiated in South American producing countries since the mid-2000s. Some of the important initiatives taken in producing countries are described in the following sections. We largely focus on Brazil as a key producer and the leading global exporter of soy.

2.5.1 National legislation in producing countries

In reaction to the sustainability impacts of the rapid expansion of industrial agriculture in the last two decades, legislative measures have been introduced in key soy producing countries in South America affected by large-scale deforestation and land conversion. Strong forest laws that comprehensively protect the remaining forests and combat illegal deforestation are of crucial importance in achieving a goal of zero forest conversion and preventing injustices for indigenous and traditional communities. However, such measures are only effective if the rule of law is backed up by strict law enforcement.[57]

Brazil

The 'Forest Code' is the main Brazilian legislation that relates to forest protection on private lands and the elimination of illegal deforestation. Following a major revision in 2012, it provides for two types of conservation on private land: Permanent Preservation Areas (Áreas de Preservação Permanente, or APPs), in which deforestation is prohibited; and the Legal Forest Reserve (Reserva Legal (LR)), for which landowners must set aside a percentage of their property for conservation (ranging between 20% and 80% of land inside, and 20% outside the Legal Amazon).

Importantly, the laws were built around a system to register farmers with claims to forested lands in the 'Rural Land Registries' (Cadastro Ambiental Rural (CAR)), which feeds into the National Rural Environmental Registry System (SICAR). The publicly accessible register provides information on each property's APP and Legal Forest Reserve.[58] The legitimacy of the self-declared property data must be confirmed through the 'CAR validation' process, usually under the remit of the state environmental secretaries. After successful CAR validation, landowners must produce an Environmental Compliance Programme (PRA) for correcting previous deficits.

After signing their commitment to PRA, landowners are provided with a pathway to either restoring or compensating previous deforestation. The Project for Recovery of Degraded and Altered Land (PRADA) includes a pledge by the landowner to maintain and recover native vegetation in APPs and/or LRs. Compensation provides several alternatives, including the acquisition of an Environmental Reserve Quota (CRA), lease of an area in a legal reserve, or the registration of an equivalent surplus area in the same biome.[59]

The CAR is meant to tackle illegal deforestation by significantly reducing the cost of monitoring, enforcement, and compliance. However, the data processing for CAR validation has experienced significant delays due to insufficient human and financial resources within federal and state environmental agencies. This disincentivizes landowner compliance with the environmental legislation.[60] Insufficient resources also mean that deforestation law enforcement remains challenging. While CAR data is now used to issue fines remotely, the substantial labor required makes it unfeasible to prosecute small deforestation events.[61]

2012 revisions provided amnesty for illegal deforestation in Legal Reserves on small properties (between 20 hectares in southern Brazil to 440 hectares in the Amazon) that took place before 2008 and reduced the area of land under restoration requirements by 29 million hectares. A 2018 ruling by the Brazilian Supreme Court made these changes constitutional. The ruling also allowed for the reduction of Legal Reserves in states or municipalities largely occupied by indigenous reserves or protected areas, and for the reduction in size of APPs.[62]

The appointments and announced policies of the new Brazilian government raise further concerns. They favor an end to the demarcation of indigenous lands and support self-regulation in the environmental licensing process for major infrastructure and development projects.[63]

The Forest Code furthermore established that beginning in 2017, financial institutions operating in Brazil could no longer provide rural credit to landowners that are not compliant with the required CAR registration of their property.[64] In 2008 in parallel with the Forest Code, the Brazilian National Monetary Council (Conselho Monetário Nacional (CMN)) established rules in its Resolution 3545, which require proof of compliance with legal and environmental legislation as a condition for approving rural credit, thus denying credit to properties embargoed due to illegal deforestation. These credit restrictions removed financial incentives and helped to curb deforestation in the Brazilian Amazon.[65] However, further adjustments to the credit criteria are required to more efficiently stimulate good practices.[66]

The Brazilian National Policy on Climate Change contains a 2009 commitment to reduce the Cerrado deforestation rate by 40% by 2020 against an average deforestation rate recorded from 1999 to 2008.[67] The Action Plan to Prevent and Control Deforestation in the Cerrado Biome (PPCerrado) intended to achieve this goal was launched in 2010 and extended from 2014 to 2015, and 2016 to 2020. It cooperates with the Soy Working Group that negotiated the Amazon Soy Moratorium and with the Action Plan to Prevent and Control Deforestation in the Legal Amazon (PPCDAm) to establish a sector-wide agreement to control deforestation in the Cerrado biome.[68]

Argentina

In Argentina, pressure from civil society led to the passage of Forest Law 26,631 in 2007 despite opposition by some lawmakers from the largely deforested northern provinces (the law came into effect in 2009). In recognition of the environmental services provided by forests, it mandated provincial governments to set up and implement land use planning processes to protect native forests and regulate the expansion of large-scale agriculture.[69] In this mandated planning process, three types of land uses are defined on the provincial map: 'red areas' are those of high conservation value that should not be transformed; 'yellow areas' have medium value and can be used for sustainable activities (mixed use); and 'green areas' have low conservation value and can be converted.[70]

Nevertheless, the UN Food and Agriculture Organization (FAO) ranked Argentina among the countries with the largest forest area lost between 2010 and 2015, including losses in demarked 'red' areas. It noted a lack of interest by the national government in enforcing the law.[71] Individual provinces authorized vast deforestation projects in red and yellow zones.72 Meanwhile, the funds assigned by the Argentinian Congress for forest protection in 2016 were 23 times less than what was established under the national forestry norm.[73]

Paraguay

In 2004, the 'Zero Deforestation Law 2524/04' was adopted, making it illegal to clear any forested land in the Atlantic Forests in the eastern part of the country. The law has been extended multiple times, and is currently in effect until 2020. It effectuated a dramatic decrease in the deforestation rate in the Atlantic Forests.[74] Illegal deforestation does still take place on a smaller scale in the remaining Atlantic forest, illustrated by 60,000 hectares of deforestation in 2016.[75] Meanwhile, legal restrictions effective in the eastern part of the country have led to a transfer of deforestation to the Chaco region in the west.[76]

The Forest Law lays down in Article 42 that rural properties in forest areas with more than 20 hectares should keep 25% of their natural forest area and preserve riverbeds and streams in order to prevent erosion and water pollution. Should this minimum percentage not be kept, the owner has to reforest an area equivalent to 5 percent of the surface of their land or the area of forest present in 1986.[77] Nevertheless, vast areas of cattle pastures and soy fields have been developed in the country's forested areas, largely in violation of the Forest Law's requirements and with significant environmental impacts. There have not been noteworthy juridical consequences to these actions.[78]

The impact of legislation on deforestation

A 2019 study by IUCN NL analyzing existence and implementation of laws on forest protection in Brazil, Argentina, and Paraguay concludes that the establishment of forest laws has managed to reduce deforestation in certain regions in the last decades.[79] However, recently there has been a worrying trend of increasing deforestation in certain ecoregions, especially the Gran Chaco (Argentina, Paraguay and Bolivia) and Cerrado (Brazil).

The laws provide certain legal protection for forests, but provide insufficient safeguards for the vast areas of natural forests and other ecosystems that have no legally protected status. Forest and environmental laws in these countries still leave vast swathes of land vulnerable to legal deforestation including 7 million hectares in the Paraguayan Chaco, 10.5 million hectares in Argentina, and 88 ±6 million hectares in Brazil (~110 million hectares in the across the three countries).

These numbers assume full legal compliance. Weak law enforcement in these countries means illegal deforestation is ongoing at an unclear scale. Recent figures indicate that close to 24% of deforestation in the Paraguayan Chaco[80] and 89% percent of the deforestation in the Brazilian state of Mato Grosso[81] was unlawful in 2017. While these figures are especially related to the beef industry, it is clear that to tackle deforestation governments must support better implementation and enforcement of laws, and the private sector must empower farmers to move from illegality to legality and zero-conversion schemes. While the FEFAC-SSGs establish strong guidelines for legal soy production, the Profundo 2019 benchmark carried out for the IUCN NL showed that the level of assurance of FEFAC-SSG compliant standards is not sufficiently reliable in all cases.[82]

2.5.2 Amazon Soy Moratorium

In reaction to public pressure, the Brazilian Vegetable Oil Industry Association (ABIOVE) and the Brazilian Grain Exporters Association (ANEC) and their respective member companies pledged in 2006 to no longer trade and finance soy originating from deforested areas within the Amazon Biome. This initiative, known as the 'Soy Moratorium', seeks to reconcile environmental preservation with the region's economic development through the responsible and sustainable use of natural resources. Besides ABIOVE and ANEC, other participants of the 'Soy Working Group' that negotiated the moratorium include the Ministry of the Environment (MMA), Banco do Brasil and civil society organizations (Greenpeace, International Conservation, IPAM, TNC and WWF-Brazil).[83] Initially extended annually, an indefinite renewal was agreed upon in May 2016.[84]

Monitoring of the Soy Moratorium by the National Space Research Institute suggests that it has been effective.[85] In the first five years, deforestation in the Amazon Biome for soy cultivation dramatically decreased, accounting only for a small share of Amazon deforestation during this time (0.41% of total reported deforestation).[86] Concurrently, soy acreage increased by 1.3 million hectares in the Amazon biome during this period. In the two years prior to the agreement, 30% of soy expansion occurred through deforestation.[87] A more recent analysis shows that from 2009 to 2014, deforestation for soy in the Amazon biome represented 5.8% of the deforestation in the 76 municipalities where 98% of the soy crop was concentrated, and 0.84% of the deforestation in the Amazon biome as a whole.[88]

However, the geographically limited scope of the moratorium means that cross-biome leakage or indirect land use change (with soy displacing another land use outside the Amazon) in the Cerrado remains a concern.[89] The increasing global demand for soy along with logistical bottlenecks and new regulations in Brazil also created spill-over deforestation pressures in neighboring countries like Paraguay, where social and environmental regulations are weaker and production costs lower.[90]

2.5.3 Cerrado Working Group

The potential for indirect land use change 'leaking' into the Cerrado as a result of the Amazon Moratorium is likely, yet difficult to quantify.[91] The biodiverse wood- and grasslands of the Cerrado have less protection than Amazon forests under environmental laws. In the eastern Cerrado region ('Matopiba', which includes the Brazilian states Maranhão, Tocantins, Piauí and Bahia), much of the cropland expansion is happening at the expense of natural vegetation.[92] Between 2007 and 2014, 52% of expansion of soy in the Matopiba region displaced native vegetation. This rate dropped to 14% between 2014 and 2017.[93] Meanwhile, already cleared land would allow for the tripling of soy production without the need for further conversion of native vegetation.[94]

In 2016, Brazil's soy industry (via its trade association ABIOVE) joined with major Brazilian consumer brands, financial institutions, government and NGOs to create the Cerrado Working Group (GTC). The GTC aims to establish a joint agreement between producers, industry, consumer organizations and civil society and an action plan to stop deforestation in the Cerrado biome.

In September 2017, a broad coalition of Brazilian environmental organizations published the Cerrado Manifesto (now signed by 61 groups). It urges supply chain actors to strengthen the implementation of their zero-deforestation commitments, inspired by the results of the Amazon Moratorium. It calls on the Brazilian government to put instruments and policies in place that can improve governance of agricultural production in the Cerrado, to create protected areas, and to ensure the right of access to the land for indigenous people, traditional communities, and small farmers in the region.[95] A 'Statement of Support' (SOS) for the Cerrado Manifesto has received signatures from 74 large, fast-moving consumer goods (FMCG) companies, as well as 51 investor signatories.[96]

The GTC had set itself a goal of reaching an agreement by the end of 2018. The biggest hurdle in achieving zero deforestation relates to costs. Convincing farmers to refrain from legally clearing forested land in the Cerrado will require a financial incentive. In a high volume/low margin commodity market, traders and retailers have struggled to agree on who should bear the cost of paying a price premium for zero-deforestation soy. At the end of 2018, ABIOVE suggested a joint, pre-competitive fund by signatory companies of the SOS, with ABIOVE members matching this sum and NGOs raising additional funds from impact investors.[97] Under the proposal, eligible Cerrado farmers would receive an average of US$ 150 per hectare per year for preserving land that could otherwise be legally deforested.[98] No final agreement has been reached at the time of writing and it remains unclear how such a fund would be administered.

Soft Commodities Forum commitment to transparency and traceability in the Cerrado

The 'Soft Commodities Forum' is a global platform convened by the World Business Council for Sustainable Development (WBCSD) aimed at uniting forces to advance collective action around common sustainability challenges. Members are the globally leading agricultural commodity and soy traders ADM, Bunge, Cargill, Cofco, Glencore and LDC. The forum has highlighted the extent and pace of Cerrado conversion to soy and cattle, and the resulting social, environmental and economic concerns. In response, in February 2019 the Forum announced a commitment to a common framework for regular reporting and monitoring of progress on transparent, traceable and quantifiable soy supply chains in the Cerrado and to cooperate with the GTC to design appropriate financial incentives.

Starting with 2018 harvest data, the SCF member companies will report individually the percentage of soy they each source in the Cerrado from the total Brazilian volume. Together, the SCF members will closely monitor municipalities with the highest risk of conversion of native vegetation to soy. The first report will be issued in June 2019.[300] It is not clear at this point how robust the monitoring system will be and what specific consequences will be drawn from the results of this initiative.

2.5.4 Agronomic approaches

In Brazil, the introduction of multi-cropping has led to an increase in production on existing cropland in recent years (this increase has also been driven by the introduction of early-maturing soybeans).[99] In multi-cropping systems, a crop of soybeans is typically followed by a crop of maize, wheat, cotton or a non-commercial crop on the same field in the same growing season. This rotation can help to slow down deforestation-driven cropland expansion.[100]

Intensification has become central to deforestation policy formulation across the tropics, as it allegedly creates a cycle of poverty reduction and reduced forest pressures. It has the potential to increase yields while limiting expansion and facilitating reinvestment in already degraded lands.[101] However, the empirical relationship between intensification and conservation of natural vegetation is not established. As future agricultural land rents rise due to productivity increases, potential new incentives for agricultural expansion and deforestation are created.[102] Nevertheless, without further efforts to improve agro-ecological conditions, large-scale cultivation of crops remains intrinsically tied to other detrimental effects of intensive agriculture, such as loss of biodiversity and high fertilizer and pesticide application rates.

Financial incentives for forest conservation should be competitive relative to future agricultural rent increases in order to mitigate future deforestation.[103] In order to prevent adverse effects, intensification should be supported by robust governance and incentives. The Soy Moratorium exemplifies this necessity; limits to land expansion by the moratorium led to intensification of soy production on existing croplands and revitalization of degraded pastures.

2.5.5 Landscape approaches

Landscape approaches are integrated approaches bringing together a range of stakeholders including companies, local communities, NGOs, and the (local) government with the aim of developing sustainable land use plans and robust governance mechanisms. Several organizations are currently piloting projects at a landscape level in soy producing countries. Among these, IDH, The Sustainable Trade Initiative is implementing a landscape approach in Mato Grosso, Brazil.

IDH convenes stakeholders to jointly develop business models, sustainable land-use plans and regulatory frameworks to achieve three interlinked goals: creating areas where commercial and food crops are grown sustainably (*Production*); forests and other natural resources are sustainably used and protected (*Protection*); and farmers' and communities' livelihoods are enhanced (*Inclusion*) – thereby contributing to the UN 2030 Sustainable Development Goals (SDGs).

In December 2015, the Mato Grosso government presented the state-level Produce, Conserve and Include plan (PCI) at the COP21 in Paris. The plan was made through a multi-stakeholder process and is supported by a broad coalition. Some of the main targets for each part of the plan include:

- *Produce:* to expand crops on 3 million hectares of degraded pasture, recover 2.5 million hectares of degraded pasture and double production, and reach 3 million hectares of sustainably managed forests;
- *Conserve:* to eliminate illegal deforestation by 2020, reduce legal deforestation by 90% compared to the 2001-2010 baseline forests, and reduce Cerrado deforestation by 95% compared to the baseline by 2030; in addition, accelerate registration of rural properties in the CAR to achieve 100% CAR validation by 2018;
- *Include:* triple access to rural credit and regularize 70% of family farming plots.[104]

A roadmap and monitoring system have been developed since that time.

The PCI plan is a state-level plan. IDH supports implementation of this plan on a more municipal level. At jurisdictional level (e.g. a municipality, district or province in a producing region), a sustainability improvement deal (the Compact) is made between private, public and civil society stakeholders. The Compact details priority sustainability topics, targets, and responsibilities. IDH is working on a compact for soy in Sorriso. A compact has been signed for beef in the northern municipalities of Juruena and Cotriguacu.

The compact is one of the three pillars of a Verified Sourcing Area (VSA), accompanied by development of a transparent supply chain and committed end buyers. VSAs aim to provide large volumes of commodities in line with sustainability commitments at a competitive scale and price, while lifting the base level of sustainability in producing regions. The objective is to verify the sustainability performance of an entire jurisdiction (a municipality or district, and later a province or state) so it is no longer necessary to verify each producer or commodity individually. This allows sustainability targets related to forest and peat protection, labor, land tenure, governance and transparency to be more ambitious in scale and impact.

2.5.6 Certification standards and programs

In reaction to the far-reaching impacts of soy production on the environment and local communities, an increasing number of standards and programs have been introduced. In the absence of efficient public governance, these voluntary systems are promoted as a catalyst for continuous improvement in reducing the footprint of global commodity supply chains.

- **FEFAC Soy Sourcing Guidelines**

  In 2015 FEFAC, representative of one of the most important soy consuming sectors globally presented its Soy Sourcing Guidelines (FEFAC-SSG), explaining it as the sector's contribution *"to a mainstream transition towards responsible soy."*[105] Currently there are 18 FEFAC-SSG compliant schemes and programs.[c] [106] Applying a minimum, baseline norm to evaluate existing and newly developed soy schemes, the SSGs comprise of 37 essential and 22 desired criteria regarding legal compliance, and environmental and social criteria. These criteria are expected to be tightened over time with the intention of encouraging continuous improvement, though no specific timeline is given for this.[107]

  Overall, the FEFAC-SSG baseline focuses on verification of compliance with national legislation such as the Forest Code in Brazil and cut-off dates mentioned therein. The industry association considers tackling illegal deforestation and land conversion as the most valuable contribution its criteria could have at this stage.[108]

- **Multi-stakeholder guided schemes**

  The Roundtable on Responsible Soy (RTRS) and ProTerra certification were the first soy-related standards, both launched in 2006. The two standards are quite similar. The key difference is that ProTerra only certifies streams of physically segregated non-GM soy from locations where risk of contamination with GM-varieties exist. RTRS offers buyers the option to purchase certification credits or mass balance products as well as an optional non-GM module. Since 2010, the International Sustainability & Carbon Certification (ISCC) began providing a soy certification for biofuel feedstock, food and feed developed with input from multiple stakeholders called ISCC Plus (or ISCC +). The continuous development of these schemes involves producers, industry and civil society, as well as commercial enterprises like traders and animal feed manufacturers. Of the three, RTRS provides the most transparency on certified volumes, destinations and buyers.

  The schemes compliant to the FEFAC SSGs can be subdivided according to their supply chain origin.

- **Farmer owned programs**

  These include the Argentinian Agricultura Certificada (ASC), the US Soy Sustainability Protocol (US SSAP) and the Brazilian Coamo. These programs are in essence good agricultural practice programs supporting farmers and subject to official control, as far as environmental and social standards are concerned.

- **Trader and importer schemes**

  These include the Amaggi Responsible Soy (ARS) standard, ADM's Responsible Soybean Standard, Bunge's Pro-S, and Cargill's Triple S scheme.

- **Feed industry schemes**

  Femas and the Belgian Feed Association (BFA). The latter buys RTRS and CRS.

- **Others**

  Others include the multi-stakeholder schemes mentioned above, as wel as the Sustainability Feed Standard, for example.

- **Global production of FEFAC SSG compliant soy**

To obtain a better understanding of adoption rates of different soy-related schemes, this report analyzed and combined public reporting by certifiers and replies to information requests to certifiers and buyers (Table 2). The inconsistent results and repeated data gaps illustrate a lack of transparency and comprehensive data on both the production and consumption side. Company-owned schemes demonstrate a particular lack of transparency.

c On 20 December 2018, the LDC Program for Sustainable Agriculture passed the ITC/FEFAC benchmarking, bringing the official list of accepted schemes to 18. This recent addition lies outside of the scope of this research.

Supply chain models [301]

The level of upstream product traceability to its origin is a key differentiator in supply chain models. There are four types of systems, ranging from a claim that the producer is compensated for extra efforts on one end of the spectrum, to a high degree of transparency and traceability on the other end (allowing for a labelled end-product).

Book & Claim certificate trading: this is a credit trading platform that provides negotiable certificates of a certified product. The credit purchase is separate to a physical product flow meaning the physical purchase of the product and the purchase of the certificate happen independently. These platforms funnel direct support to farmers and allow farmers without access to direct sustainable demand to participate and be rewarded for sustainable practices. The focus lies on compensating producers for adapting their farming practices without having access to the physical demand for sustainable products.

Mass Balance: certified and non-certified products can be mixed at any point in the supply chain. An administrative trail ensures that the output of certified soy delivered to customers does not exceed the input of certified soy received at the upstream location. The certified products must follow the physical flows which means it can be traced via transportation routes to the farm of production and to the receiver of the certified mass balance products. This approach focuses on allowing certified and noncertified products to mix, so no incurring segregation costs but still giving producers in the supply chains the opportunity to respond to the demand for sustainable products. Amongst others, this is offered by ISCC+ and Cargill's Triple S.

Area or group mass balance: a supply chain model that combines criteria from the mass balance and the book & claim systems. The raw material comes from certified sources located in specific areas and is followed administratively through the supply chain via a mass balance approach. However, the product can be mixed with non-certified materials. Purchasers can obtain credits directly from growers, provided that these growers operate in the same geographic area as the soy that is bought on the regular market. Since June 2018 RTRS has offered the possibility to select credits from particular regions, or to buy credits from specific farmers in selected areas through special agreements. Cefetra also offers CRS area mass balance-certified soy.

Segregation: the consumer knows that 100% of the relevant ingredient used consists of certified materials.

> ***Bulk Commodity Segregation:*** the certified product is kept physically separate from other products that are not certified, but certified products coming from different sources can be mixed).
>
> ***Identity Preserved (IP):*** the certified product is physically separated from other products originating from other sources. A high level of transparency allows to trace the identity of the specific producer throughout the entire chain. IP is relevant for GM-free assurance.

Direct sourcing: though still an exception, a new trend is emerging recently to re-establish direct connections between buyers and deforestation risk zones, such as in the Cerrado. This involves direct trade commitments between farms producing certified soy and downstream companies that want to establish transparent supply streams.

Landscape approaches: involve joint agreements among various public and private stakeholders, aiming to link governance at jurisdictional level and value chains in multi-functional landscapes to achieve joint sustainability goals.

Table 2 Overview of production and destinations of FEFAC-SSG compliant schemes, 2017

Name	Producing countries	Compliant volume in tons	Destination countries
ADM Responsible Soybean Standard	Unknown	Unknown	Unknown
Agricultura Sustentable Certificada[d]	Argentina	210,000	~30% EU+
Amaggi Responsible Soy Standard	Brazil	483,000	EU+?
BFA mv-soja	see CRS/RTRS	n/a	Belgium
Bunge Pro-S	Brazil	Unknown	Unknown
Cargill Triple S	Brazil (Paraná, Mato Grosso, Pará and Goiás)	Unknown	Unknown
Certified Responsible Soya (CRS)	Argentina: 246,800 t Paraguay: 51,841 t Brazil: 615,139 t	913,780	Northern Europe
Donau Soja / Europe Soya	Ukraine, Italy, Austria, Serbia	200,000	EU+
Femas UK	Brazil	n/a	UK
ISCC Plus[e]	Ukraine, Argentina, Romania, Brazil	640,000	Unknown
Programa Coamo	Brazil	Implementation started	n/a
ProTerra	Brazil: ~900,00 t Argentina: ~40,000 t Europe: 21,381	964,834	EU+, incl. Germany, Netherlands, Norway, Belgium, France
RTRS	Brazil 78% Argentina: 14% India: 4% China: 2% Paraguay: 2%	4.07 mln	Netherlands: 66% Scandinavia: 10% Brazil: 9% UK: 5% Germany: 4% Belgium: 3%
Sustainable Feed Standard	n/a	n/a	n/a
Sustainable Farming Assurance Program (SFAP) and SFAP non-conversion	Brazil, U.S.	300,000, of which 80% non-conversion	Netherlands Belgium Germany UK
U.S. Soy Sustainability Assurance Protocol (SSAP)	U.S.	11.6 mln	Europe: 24% N-Asia: 36% Americas: 17% MENA: 6% SE-Asia: 4%

Notes: The Louis Dreyfus Company (LDC) program for Sustainable Agriculture was added to the list of FEFAC-SSG compliant standards in at the end of 2018.
Sources: Publications by scheme initiators, personal communication.

Based on the available information, it can be concluded that at least 19.4 million tonnes of FEFAC-SSG compliant soy were produced globally in 2017. The U.S. Soy Sustainability Assurance Protocol (USSAP) certified 11.6 million tonnes in 2017. Besides USSAP, FEFAC-SSG compliant production had a geographic focus in Brazil, driven by RTRS and ProTerra.

d Ongoing digitization, more accuracy on certified volumes expected in 2019

e ISCC EU for biofuels EU, ISCC + for food, feed, bio-based products, energy, biofuels outside EU

2.6 DEMAND-SIDE INITIATIVES

In the EU+ countries, various public, private, and hybrid initiatives/interventions related to delinking deforestation from commodity supply chains have been established. Many leading consumer goods companies support the Cerrado Moratorium and similar initiatives like the New York Declaration on Forests. Pre-competitive, multi-stakeholder soy roundtable initiatives have been set up in several European countries. EU-wide and national public initiatives have been introduced in recent years aiming to tackle the sustainability issues connected to soy sourcing. Overall, it appears that the private sector has been more active in committing to address sustainability issues in forest risk commodities than governments in the EU and its member states.[109] The following sections provide brief profiles of selected private and public-sector initiatives on the demand side. Demand side initiatives are also relevant to tackling sustainability issues in the soy supply chain.[f]

2.6.1 Commitments by downstream supply chain actors

Animal feed producers, livestock producers, food companies, retailers and other downstream supply chain actors have undertaken various initiatives to address the environmental and social impacts of soy cultivation over the years. An overview of the most important commitments is provided below:

National roundtables on soy

Various national roundtables have been established in soy consuming countries in recent years. Thes pre-competitive forums consist of diverse groups of stakeholders including food businesses, retailers, industry associations and civil society groups, often with the support of the national government. Chapter 5 provides more detailed profiles of national roundtables in Amsterdam Declarations Partnership countries.

- The UK Roundtable on Sustainable Soya established in 2017 is an example of a more advanced discussion, that has resulted in a commitment to publish time-bound plans to achieve sourcing that is “legal and cultivated in a way that protects against conversion of forests and valuable native vegetation”. Participants committed to publish time-bound plans by April 2019, and to achieve progress towards this goal by 2020.[110]
- In Switzerland, the Soy Network (Soja Netzwerk) has defined core criteria for its expectations of the production and sourcing of soy for animal feed. All soy imported for feeding purposes must be certified and fulfill a list of six criteria including: no conversion of forests or valuable ecosystems, good agricultural practices ,reduction in the use of pesticides and in GHG-emissions, GM-free certification, exclusion of land conflicts, and respect for the rights of indigenous and local communities.[111] Under consideration of these guidelines, the Soy Network currently accepts the Bio Suisse Guidelines, ProTerra standard, RTRS Non-GM Standard, ISCC PLUS with ‘Non-GMO’ module, Danube Soya and Europe Soya Standard. A 2017 benchmark conducted for these standards gives recommendations on further strengthening of the criteria.[112]
- The Swedish Soy Dialog (Sojadialogen) is a broad network bringing together feed companies, food producers, industry organizations and trading companies. In order to support responsible production, the members ensure that 100% of the soy used is stemming from physical flows or covered by credits that are verified by a credible standard. It currently approves RTRS, ProTerra, EU Ecological and IFOAM certification systems.[113]
- The Dutch Soy Platform Initiative was established at the end of 2018 to react to the new momentum created by the Amsterdam Declarations Partnership. It brings together public and private stakeholders with the aim to step up efforts towards certified, deforestation-free soy used in and exported from the Netherlands. The platform seeks to increase Dutch and European purchasing of certified deforestation-free soy, and to increase the positive impact of sustainable sourcing in soy producing countries. Participants aim to do this by including more complex products, such as pizza, to be covered by credits, stimulating the connection of credits with risk-landscapes, implementing physical soy streams from pilot jurisdictions, and cooperating with other European country partners to increase the demand for responsible and deforestation free soy.

f The 2018 analysis by COWI, Ecofys and Milieu on behalf of the European Union provides an inventory of initiatives taken against deforestation in supply chains (COWI, Ecofys and Milieu (2018), Feasibility Study on Options to Step Up EU Action Against Deforestation - Inventory of Existing EU Policies, Legislation and Initiatives Addressing the Drivers of Deforestation and Forest Degradation, Brussels, Belgium: European Commission).

Consumer Goods Forum

The Consumer Goods Forum (CGF) is a global initiative bringing together food producers and retailers. In 2010, the 400+ members of the CGF committed to achieving zero net deforestation in their supply chains of key commodities – soy, palm oil, pulp/paper, and cattle – by 2020.[114] In 2014, the Soy Working Group (SWG) of the CGF published the 'Sustainable Soy Sourcing Guidelines' including recommendations for sourcing deforestation-free soy. These were updated in 2016. The guidelines identify standards and programs that meet the minimum requirements of the SWG. The CGF recommends RTRS or equivalent certifications such as Pro Terra, SAN (Rainforest Alliance), and ISCC Plus (plus voluntary add-ons 20202-1 and 2020-2). According to the 2016 guidelines, *"[t]o move towards deforestation-free soy supply chains, [...] companies should, by 2017, publish a time-bound implementation plan to remove deforestation from their global soy supply chains by 2020. This plan should be public and include intermediate KPIs against which companies should report. In this way, excluding illegal-deforestation from a company's supply chain can be seen as a stepping stone towards the goal of deforestation-free global soy supply chains."*[115] The CGF guidelines have gained some traction, but their voluntary character has limited their influence.

With 2020 approaching, the CGF set up the Soy Buyers Coalition (SBC) in June 2018. The SBC is a pre-competitive project that is open to non-CGF members. It puts less emphasis on earlier, stricter guidelines, and adds alternative ways to work towards deforestation-free sourcing. The SBC"[...] aims to bridge the gap between soy buyers and on-the-ground producers, with a view to finding new ways to tackle deforestation linked to soy production." Within the Coalition, downstream users of soy (retailers, animal feed manufacturers, and FMCG manufacturers) aim to work closely with key stakeholders including soy producers, traders, local governments, investors, and NGOs.[116]

Retailers' Soy Group

The Retailers' Soy Group was formed in 2013 and counts ten leading European retailers as its members.[g] The group was established out of the recognition that soy-related deforestation in their supply chains could pose a significant risk to their business.[117] At the same time, the members expressed the believe that the growth in demand for soy could be disconnected from the environmental and social issues through better management of land use change combined with maximizing productivity. However, implementation is lagging. The retailers identified ProTerra and RTRS as meeting their requirements. They aim to source deforestation-free soy, and prohibit production on HCV land and HCS land with a conversion cut-off date not later than 2009.[118] RTRS turned into a no-conversion standard in June 2015.

Financial mechanisms

Access to finance is a critical success factor for landscape and sustainability initiatives. The CGF in cooperation with the Banking Environment Initiative (BEI) and with advice from the WWF developed the Soft Commodities Compact in 2012. The goals of the compact support the CGF commitment to achieve net zero deforestation in the supply chain of its businesses in the consumer goods sector. As part of the Compact, the participating international banks aim to help their clients free their supply chains from deforestation, with soy as one of the focus commodities. The initiative builds on the vital role of the banking sector in provisioning finance for the production and trade of agricultural commodities.[119]

IDH is a Technical Assistance (TA) partner for three innovative investment funds that promote sustainable land use: The Land Degradation Neutrality Fund, the &Green Fund, and the AGRI3 Fund. As a TA, IDH supports promising projects that would otherwise not meet investment criteria through technical advice, feasibility assessments, and financial structuring. Post-investment, TA helps maximize the project's sustainable land-use impact and monitor the investment's impact on ESG criteria.

g Ahold Delhaize (Netherlands), ALDI South Group (Germany), COOP Switzerland, Federation of Migros Cooperatives (Switzerland), and from the UK Asda (part of Walmart (U.S.)), Marks & Spencer, Sainsbury's, Tesco, The Co-operative Food and Waitrose.

2.6.2 Public-private soy initiatives

> **New York Declaration on Forests**

In September 2014 governments, companies, civil society, and indigenous peoples signed the New York Declaration on Forests (NYDF). Today, more than 190 signatories including more than 50 governments support the Declaration. The signatories commit to ensure that strong, large-scale incentives will be put into place to achieve at least halving the rate of loss of natural forests globally by 2020, and strive to end natural forest loss by 2030. For agricultural commodities, the NYDF set a more ambitious goal of eradicating tropical deforestation from the supply chains of palm oil, soy, paper, and beef products by no later than 2020 was set.[120] Europe is one of the major importers of palm oil and soy.

2.6.3 Public sector initiatives on soy-related deforestation

> **Amsterdam Declarations Partnership**

The Amsterdam Declaration (AD) 'Towards Eliminating Deforestation from Agricultural Commodity Chains with European Countries' was established in December 2015. Now, under the name Amsterdam Declarations Partnership (ADP), the group includes seven signatories: Denmark, France, Germany, Italy, the Netherlands, Norway, and the UK. The political, non-legally binding intention is motivated by the ambition to achieve the Sustainable Development Goals (SDGs) and to reach the goal of staying below 2ºC of global warming. To this end, the Partnership aims to halt deforestation driven by the agricultural commodity trade by 2020 through support of public and private initiatives.[121]

Initially focusing on palm oil, in 2018 soy and cocoa were added as priority commodities due to EU consumption levels.[122] ADP countries play a significant role in these global supply chains. Their imports accounted for around 62% of EU soy imports in 2017/18 and around 6% of globally traded soy.[123] The ADP promotes the voluntary uptake of certifications with deforestation cut-off dates, such as RTRS and ProTerra.[124]

The market situation in the ADP countries, key soy consuming sectors, trade relations, and public and private initiatives to delink protein supply chains from deforestation are discussed in Chapter 5.

> **EU Action Plan on Stepping up Action Against Deforestation**

In 2018, the European Commission presented its Roadmap on Deforestation and Forest Degradation based on the idea of an EU initiative against deforestation and forest degradation raised in 2013 in both the EU Forest Strategy and the 7th Environment Action Program. It recognizes the EU's role in deforestation as a large-scale importer of deforestation-risk commodities, and recognizes the EU's potential to be part of the solution. The aim is to develop a more coherent and comprehensive approach to the problem and to increase the coherence of existing EU policies and tools.[125] The European Commission held a public consultation of stakeholders in early 2019 to gather information and views on potential EU action against deforestation and forest degradation, with further communication planned for 2019.[126]

In September 2018, the European Parliament adopted a resolution calling on the Commission to regulate the EU trade and consumption of forest-risk commodities including soy based on lessons learned from existing legislation. The resolution called on the Commission to introduce mandatory criteria for sustainable and deforestation-free products, establish mandatory due diligence obligations on all supply chain operators in forest-risk commodity supply chains, and to enforce traceability and transparency throughout the supply chain.[127]

> **EU Renewable Energy Directive (RED)**

The EU Renewable Energy Directive (RED), adopted in 2009, is the common EU framework for the production, promotion, and consumption of renewable energy, including all biofuels. It establishes common sustainability criteria for EU member states that are required to certify mandatory renewable energy targets and to obtain EU support. All EU countries must ensure that at least 10% of their transport fuels come from renewable sources by 2020.

Companies can demonstrate compliance by participating in one of the voluntary schemes that have been recognized by the European Commission. In January 2019, the U.S. Soybean Sustainability Assurance Protocol (SSAP) was added as the 17th compliant scheme. This is part of the implementation of the Joint Statement agreed upon between Presidents Juncker and Trump in July 2018. Among other things, they agreed to increase trade in soybeans. The decision does not increase the share of crop-based biofuels that are eligible to account toward the renewable energy target.[128]

Since RED was implemented, a lot of attention has gone to the negative indirect impact that the production of biofuels may cause due to Indirect Land-Use Change (ILUC).h,[129] A revised directive (RED II) was adopted by ministers in December 2018. Crop-based biofuels falling under "high ILUC risk" will be frozen at 2019 levels until 2023 and gradually phased out by 2030.[130]

h ILUC can occur when pasture or agricultural land previously destined for food and feed markets is diverted to biofuel production. As food and feed demand still need to be satisfied, this may lead to the leakage of agriculture production into areas with HCS such as forests, wetlands, and peatlands. Such conversion may cause greenhouse gas emissions that negate emissions savings from the use of biofuels instead of fossil fuels.

The European Commission recently drafted a delegated act for a certification process for assessing high ILUC risks, with consultation running until March 2019. This was accompanied by the publication of a status report on the production expansion of relevant crops. According to its current accountings, soy does not categorize as high ILUC risk.[131] This classification may lead to an increased use.

> **Public procurement**

The European Union has developed Green Public Procurement (GPP) guidelines as a voluntary instrument. Member States' authorities translate this into national criteria and decide on the scope and level of ambition.[132] The public sector, with annual expenditure of more than € 200 billion on food and catering services, can play a significant role in transforming supply chains.[133] The GPP criteria for Catering & Food published in 2008 identify *"[s]oil erosion, forest destruction and loss of biodiversity caused by inappropriate agricultural practices"* as a key environmental impacts. To reduce these impacts, it recommends increasing the share of organic products or food produced under integrated production systems.[134] No specific reference to soy or other forest-risk commodities is made yet. The criteria are currently under revision.[135]

Examples of national interpretations of GPP related to deforestation in supply chains include the mandatory UK Buying Standards, which strictly limits sourcing of certified palm oil.[136] Sweden has introduced voluntary sustainability principles for public sector catering services where the 'advanced' criteria refer to the responsible production of soy for animal feed, suggesting the use of RTRS, ProTerra, or equivalent schemes to meet the specifications. The 'spearhead' criteria include a complete ban on the use of soy in feed.[137] The Norwegian Parliament in 2016 called for a public procurement policy that eliminates deforestation from supply chains (see section 5.6.4). In France, the aim to halt deforestation caused by imports of forest or agricultural products by 2030 will impact public procurement decisions with guidelines expected in 2019 (see section 5.2.4).[138]

> **The EU Protein Strategy**

The annual total feed crude protein use in the EU28 is estimated at 86 million tonnes (2017/18), of which 78% were produced from home-grown sources. Soybean meals accounted for 13.2 million tonnes of "hi-pro" crude protein sources (30% to 50% crude protein), of which only 0.4 million tonnes were produced in the EU. In the overall hi-pro crude protein segment (including e.g. rapeseed and sunflower meals), the EU self-sufficiency reached 40%, while it is 90% or higher for other crude protein sources.[139]

Locally produced protein crops have the potential to raise the plant protein self-sufficiency of the EU. Demand for EU sourced protein is increasing as demonstrated by the growing use of rapeseed and sunflower meal and reductions in soymeal use in Germany in recent years.[140] Obstacles for increased development of EU plant protein include suboptimal agronomic conditions for large-scale production, the competitiveness of EU production versus imported plant proteins, competition over the use of arable land, and a lack of research on breeding and agronomic practices.[141] The direct and indirect measures to encourage EU plant protein production included in the Common Agricultural Policy have not yet been sufficient to overcome these obstacles yet.[142]

The European Parliament adopted a report in April 2018 calling for a strategy to promote local protein crops, to diversify imports, increasingly source in Europe, and to support research into increasing profitability and yields.[143] In 2018 the European Commission committed itself to review the supply and demand situation and to investigate options to further develop economically and environmentally sustainable domestic plant protein production.[144]

In July 2017 14 EU agricultural ministers signed the Europe Soya Declaration, a joint statement with the Donau Soja Organization.[145] As of January 2019 this number has risen to 19 signatories including four ADP countries (France, Germany, Italy, and the Netherlands). To satisfy the demand for plant proteins and the increasing consumer interest in GM-free and organic products, it calls for sustainable and certified domestic production, processing, and marketing of protein crops with a focus on soy. Suggested measures include support for locally adapted *leguminosae* cultivation, optimized feed systems, and support for certified imports.[146]

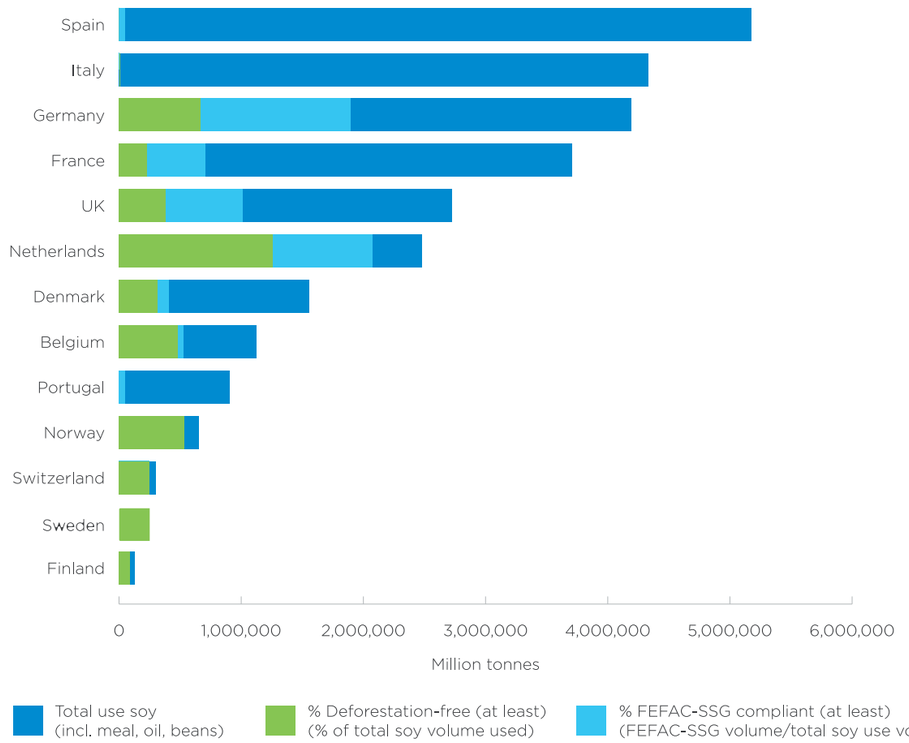
2.7 SCOPE OF COMMITMENTS AND PROGRESS MADE ON SOY

2.7.1 Progress lags despite strong commitments

Several civil society-led initiatives track progress towards the public and private sector commitments to eliminate deforestation in the global soy supply chain by 2020. In 2018 the Supply Change initiative analyzed deforestation-related commitments by companies that may face material financial risks such as supply disruption, cost volatility, and reputation damage from their involvement in forest-risk commodities. It found that only 44% of companies of companies with public commitments made a statement of traceability intent, of which the majority only made aspirational statements. Among companies with a commitment, clear and actionable commitments to implement supply chain traceability were only identified in 47% of them. Palm oil is covered most widely, while soy-related commitments are still rare.[147] This lack of action on soy is confirmed by other analyses, such as Global Canopy with the Forest500, and the Carbon Disclosure Project (CDP) with carbon disclosure reports that track company commitments on deforestation commodities.[148]

Similarly, the 2018 progress assessment on the New York Declaration on Forests conducted by a network of 23 CSOs and research institutions found that the achievement on most pledges lagged two years before the 2020 deadline. From 2014 to 2017 average annual emissions from gross tree cover loss increased in more than 70 tropical forested countries compared with a 2001 to 2013 baseline. Government recognition of indigenous and local community rights remains low. Jurisdictional approaches that bring multiple stakeholders together to enact positive change throughout a region are emerging, with active programs in 34 jurisdictions across Asia, South America, and Africa. Many of these approaches are still in nascent stages and a lack of comprehensive information on the implementation status of these projects hinders a proper assessment.[149]

Figure 10 The market share of FEFAC-SSG compliant and and deforestation-free soy



2.7.2 Uptake of FEFAC-SSG compliant and deforestation-free soy in EU+ countries

This report aims to increase transparency on progress towards achieving commitments to improved sustainability in the soy supply chain of EU+ countries. To this end, data on the uptake of soy certified under the FEFAC-SSG and the deforestation-free standards within has been gathered from a range of sources including partial country-level information provided by the compound feed industry in Europe, info from different certification schemes, and individual company reporting. Overall, a lack of detailed and consistent data from industry and certification body disclosures on soy sourcing, processing, and consumption means that at this stage only minimum estimates can be provided.

According to 2017 data, at least 7.6 million tonnes of soymeal in EU+ countries was compliant with the broader FEFAC-SSG compliant standards and programs. This equaled at least 22% of the total soybeans, -meal, and -oil used in the EU+ countries (34.4 million tonnes). At least 4.5 million tonnes (13% of total soy used in the EU+ countries) were certified under deforestation-free standards identified by Profundo's draft benchmark study (RTRS, ISCC +, Proterra, Danube / Europe Soy, CRS / BFA and SFAP-Non Conversion).[150]

A review of the deforestation-free schemes shows that in 2017 at least 6.8 million tonnes (around 2% of global soy production, 7% of European use) were certified by RTRS and ISCC +. These standards covered more than 80% of the selected assurance criteria set by the benchmark. The draft benchmark has passed through two rounds of revision but may still be subject to changes before final publication.

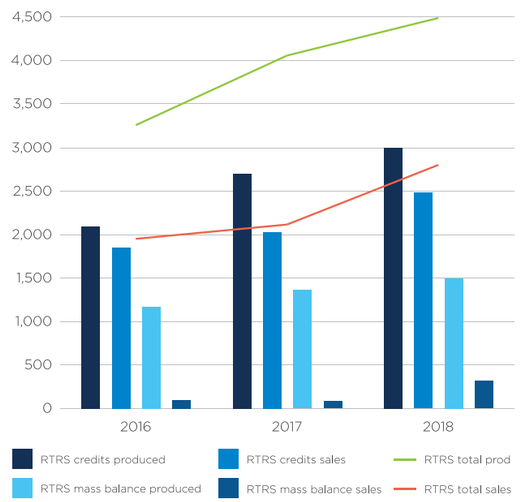
Certification is an important tool, but additional measues are needed to achieve deforestation free landscapes. It may well be that other schemes de facto also delivered certain volumes of deforestation free soy. The 13% and 7% respectively therefore should be seen as a indicator of progress on verification and control of deforestation, and not as an absolute given.

2.7.3 Lack of demand as a limiting factor

Due to a lack of detailed data availability it was not possible to obtain a complete picture of total soy certified under a specific scheme/program versus eventual volume sold at a premium. However, there are several examples that illustrate that despite occupying a small share in overall production, not all soy certified under deforestation-free schemes was sold under those premium labels in recent years. As a result it hasn't delivered the financial incentive to producers that would stimulate further investment. While production and sales have increased over the years, the various commitments and dialogues established at the downstream end of the supply chain have not yet translated into demand.

Figure 11 illustrates this point with data on RTRS-certified soy. In 2017, 52% of RTRS production was sold as certified soy. This share reached 62% in 2018. This means that for RTRS soy alone, an additional 2 million tonnes could have been sold at a premium in 2017 and 1.7 million tonnes in 2018. Similarly, around 73% of total area mass balance credits available under CRS certification were sold in 2017.[151] Donau Soja / Europe Soya sold around 65% of the 2017 certified production at a premium.

Figure 11 Development of RTRS soy production and sales, 2016 to 2018



Source: RTRS (2019), "RTRS annual summary 2018"; RTRS (2018), *Management Report 2017*, pp. 8-9; RTRS (2019), "RTRS annual summary 2018".

03

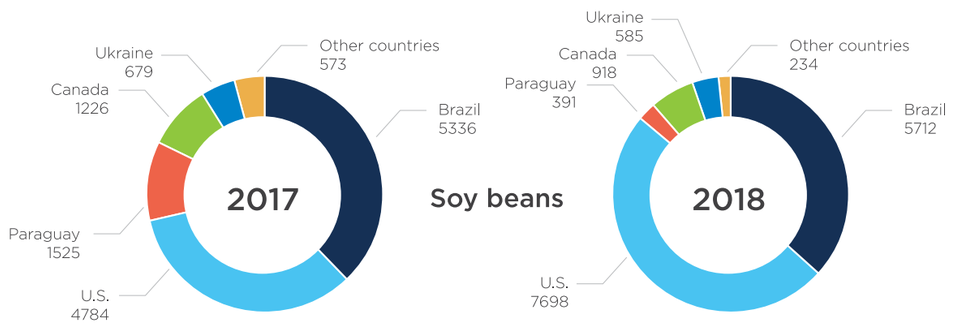
Analysis of the European soy supply chain

3.1 SOY TRADE FLOWS INTO EUROPE

In 2017 the EU+ countries imported a total of 33.8 million tonnes of soy (soybeans, -meal and –oil). Soybean meal accounted for most of this volume with a total of 19.4 million tonnes. Soybeans accounted for 14.1 million tonnes. Soybean oil imports totaled just 277,000 tonnes (Table 3).

In addition, 2017 domestic production in EU+ countries reached 2.7 million tonnes. 15 million tonnes of the available soybeans were crushed into soybean meal and soybean oil. A portion of these soy products were (re-)exported, leaving a total of 34.4 million tonnes of protein meal (40.5 million tonnes of soybean equivalents) for processing by the feed and food industries and in technical applications in the EU+ countries.

Figure 12 Key countries of origin of soy imports to EU+, 2017 (1,000 tonnes)



Source: ISTA Mielke (2018, May), *Oil World Annual 2018*, Hamburg, Germany ((CH, NO); *Eurostat* (n.d.), "International trade in goods – detailed data", online: ec.europa.eu/eurostat/data/database

Table 3 Soybeans and soy products available for processing in EU+, 2017 (1,000 tonnes)

Soy products	Import	Cultivation	Crushing	Result of crushing	Export	Losses & changes in stock	Processed in EU+
Beans	14,123	2,743	15,012	-	361	-375	1,118
Meal	19,421		-	11,785	321	-	30,885
Oil	277		-	2,777	790	92	2,356
Total	**33,821**		**15,012**	**14,562**	**1,471**	**-183**	**34,360**

Sources: ISTA Mielke (2018, May), *Oil World Annual 2018*, Hamburg, Germany; *Eurostat* (n.d.), "International trade in goods – detailed data", online: ec.europa.eu/eurostat/data/database

The Netherlands is by far the most important importer of soybeans, -meal, and -oil among the EU+ countries. In 2017 the Netherlands imported a total of 7.0 million tonnes, accounting for 21% of total imports to the EU+ group. Germany was the second largest importer with 5.8 million tonnes (17%). Both countries are important transshipment hubs, meaning that a considerable share of these imports is re-exported to other (mostly EU-28) countries either directly or after crushing. Intra-European trade of produce from extra-EU origins makes it difficult to track actual country of origin.

3.2 SOY CONSUMPTION VOLUMES AND KEY SECTORS IN EUROPE

As explained in Table 3, 34 million tonnes of soybeans, -meal, and -oil were available for processing in the EU+ countries in 2017. The use, consumption, and trade of these volumes can be broken down by key sectors.

3.2.1 Direct food use

According to estimates, food consumption accounted for approximately 250,000 tonnes of soybeans in 2017/18.[152] Around 620 million liters of plant-based drinks from soybeans were sold in the EU in 2018, up from around 200 million liters in 2003.[153] In addition, approximately 1.3 million tonnes of soybean oil were consumed as food in the EU+.[154]

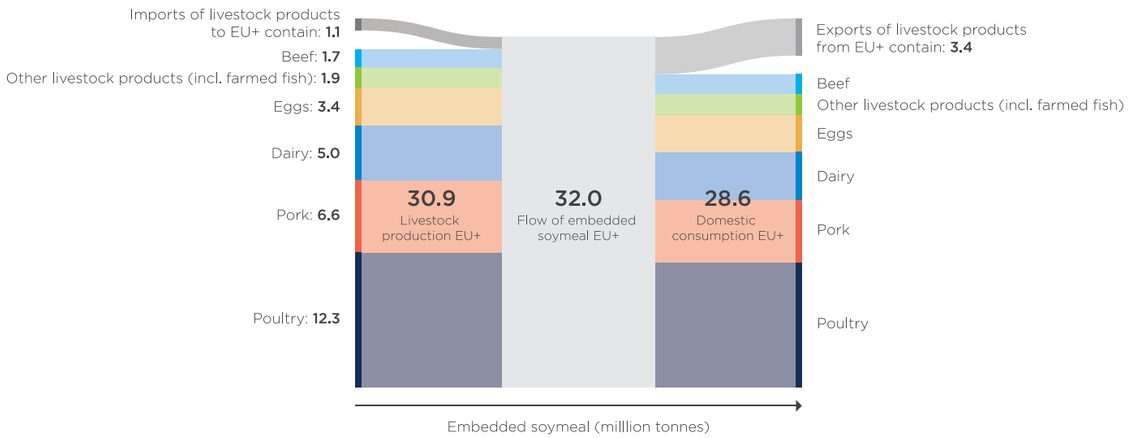
3.2.2 Livestock products

In total, 30.9 million tonnes of soymeal were available for use in animal feed in 2017. The 868,000 tonnes of soybeans remaining after deducting food consumption were also presumably used in feed, however there is no data on the distribution across sub-sectors and countries. With an estimated 20.8 million tonnes, the production of poultry, pork, and beef used the largest volume of the total soymeal embedded in animal feed. Dairy accounted for around 5.0 million tonnes, while egg production used 3.4 million tonnes.

Exports of livestock products in 2017 contained an estimated 3.4 million tonnes of embedded soymeal, while 1.1 million tonnes of soymeal were embedded in imports. This resulted in a consumption of about 28.6 million tonnes of soymeal embedded in livestock products in the EU+ countries in 2017. Meat accounted for approximately 68% of total consumption of embedded soymeal in EU+ countries, dairy products for 15%, and eggs for 12%. Feed for aquaculture and other livestock consumed an estimated 5% of the total volume. The total embedded consumption of soymeal equaled approximately 36.4 million tonnes of soybeans.[i] Based on average yields, this embedded soymeal consumption required approximately 12.7 million hectares of land.

i The soybeans crushed for the production of soymeal resulted in approximately 4.5 million tonnes of soybean oil. This is more than EU+ countries consumed in that year.

Figure 13 Estimates for embedded soymeal in livestock production and consumption in EU+ countries, 2017



Source: Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs and livestock production.

Soybean oil is one of several feedstocks used in biodiesel (FAME, fatty-acid mono-alkyl esters) production in the EU+.[j] The use of soybean oil in conventional biodiesel is limited by the EU biodiesel standard DIN EN 14214. Biodiesel based on soybean oil does not comply with the iodine value prescribed by this standard. It is, however, possible to meet the standard by using a feedstock mix of rapeseed oil, soybean oil and palm oil.[155]

The EU-28 tops the list of biodiesel producers globally. Total production in 2016 was 12.6 million tonnes. Biodiesel production in Europe is concentrated in a small number of countries. In 2016, Germany accounted for around 25 percent of the EU-28 production. France, Spain, and the Netherlands are other important producers.[156]

There is a lack of detailed figures on the use of different feedstocks in biodiesel production. Vegetable oil-based feedstocks are mostly reported as aggregated figures. In 2017 the researchers of the not-for-profit European coalition Transport & Environment concluded in that *"[...] there is an acute lack of transparency about the biofuels used in the EU with data either unavailable or very hard to access"*.[157] This makes it difficult to make definite claims about the use of soy in biofuels.

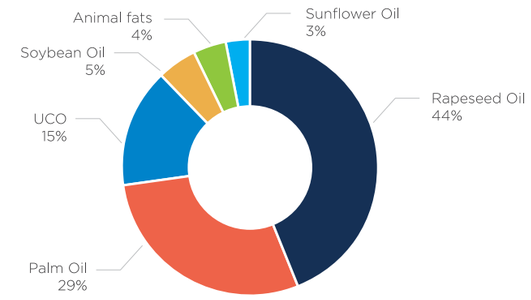
Available estimates suggest that European biodiesel mostly relies on rapeseed as feedstock. The consumption of soybean oil for biodiesel was estimated at 5%, equaling around 627,500 tonnes (Figure 14).[158] This is around 25% of soy oil consumption in EU+ countries. After 2020, the biofuel feedstock distribution and the role of soybean oil as a feedstock will depend on the exact phrasing of the EU Commission's criteria concerning "high indirect land-use change (ILUC)" biofuels under the EU Renewable Energy Directive to 2030, scheduled for release in 2019 (see section 2.6.3).[159]

Among the EU-28, Spain uses the most soybean oil in biodiesel production. Smaller amounts are used in Germany, Italy, Portugal, France, Bulgaria, Romania, and Greece. The country-level situation in the Amsterdam Declaration countries is further explained in the country profiles in Chapter 5 to the extent that data availability allows. The use of soy oil in domestic biodiesel production does not necessarily equal its share in domestic consumption.

This does not yet consider soybean oil used as feedstock for biodiesel (FAME) imports from Argentina after the EU lifted anti-dumping duties on biodiesel imports from Argentina in September 2017.[160] While no imports from Argentina were reported in the first eight months of 2017, imports increased quickly in the last four months of the year, increasing Argentina's share of imports to 30% of total biodiesel imports that year. 2018 saw a further rapid increase in biodiesel imports from Argentina.[161] European biodiesel producers reacted to the cheap imports from Argentina with cutbacks or production stops, leading to a significant price drop for rapeseed futures (the key feedstock in EU production).[162] A separate investigation by the European Commission into the use of biodiesel subsidies by the Argentinian government is ongoing with a deadline for definitive measures on 27 February 2019.[163]

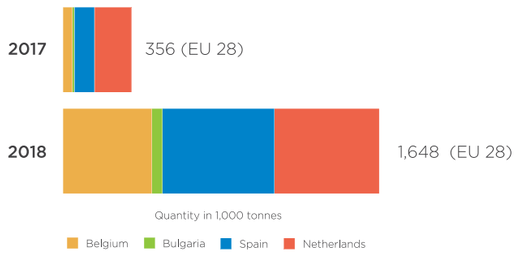
The 2018 biodiesel imports from Argentina largely entered through three member states: the Netherlands (36%), Spain (31%), and Belgium (29%). These three countries are also important exporters of FAME to intra-European destinations.[164] It is not possible to further trace these volumes through the supply chain.

Figure 14 Estimated shares of feedstock used in biodiesel production, EU-28 in 2017



Note: UCO=Used Cooking Oil.
Source: ISTA Mielke OilWorld, In: UFOP (2018, December), "Chart of the week (49)", online: www.ufop.de/english/news/chart-week/

Figure 15 Biodiesel imports from Argentina to EU28, 2017 vs 2018 (1,000 tonnes)



Source: Eurostat (n.d.), "International trade in goods - Detailed data", online: https://ec.europa.eu/eurostat/data/database

j Reported under HS Code 38260010 (fatty-acid mono-alkyl esters containing by volume => 96.,5% of esters "FAME"). FAME are a type of fatty acid ester created during the transesterification of vegetable oils and animal fats to make biodiesel.

04

European soy production

As outlined in Chapter 2, the European Union is working on a strategy to increase the share of domestic cultivation of high-protein crops, and reviewing a variety of crops including soybeans. Growth in domestic production can be observed in several EU+ countries and in the broader European region including countries like Ukraine, Russia, and Serbia. The following section provides an overview of the developments of soy cultivation in EU+ countries in recent years, and prospects for further expansion.

4.1 EU+ SOY CULTIVATION

Soy cultivation in Europe has undergone significant growth in the last 10 years, increasing from a total yield in the EU+ of 764,000 tonnes in 2008 to 2.7 million tonnes in 2017 (Figure 16).

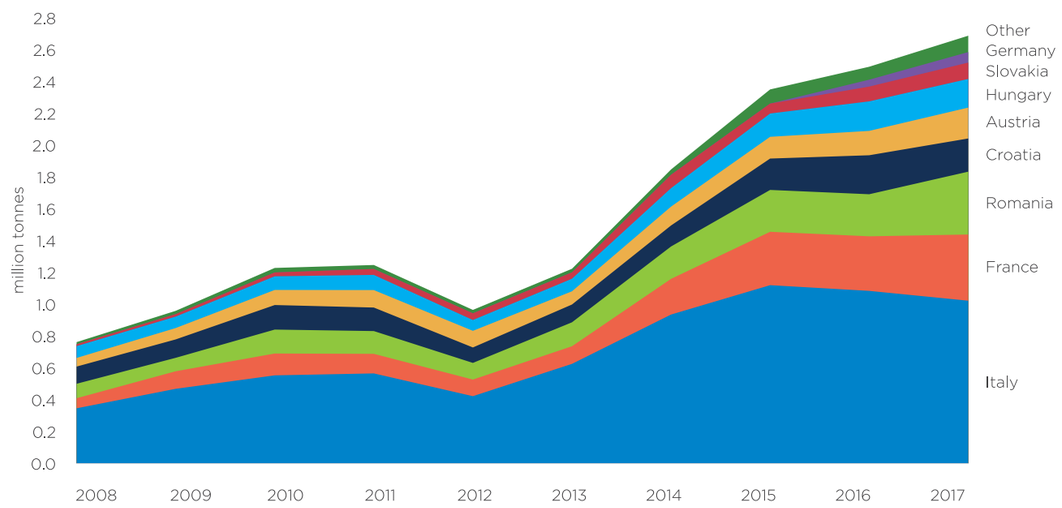
In 2017 the area under soybean cultivation in these countries covered a total of 0.97 million hectares. The average yield was 2.8 tonnes per hectare, though there was variation across countries. Yield reached up to 3.2 tonnes per hectare in Italy while falling below the average in other smaller producing countries. In addition, productivity has shown strong growth rates in the key producing countries in the EU-28.[165] These figures compare to an average yield of 2.3 tonnes per hectare in Argentina, 3.3 tonnes per hectare in the U.S. and 3.4 tonnes per hectare in Brazil.[166]

Italy is by far the largest soy producer among the analyzed countries, accounting for 37% of the production in 2017. France is the second largest producer in the EU (15% of production), followed by Romania (14% of production). Both countries showed a continuous increase in production over the last five years. Other countries in this group all have shares below 10% of the total.

In recent years additional countries have started to pilot soy cultivation leading to rapidly increasing amounts of land dedicated to cultivation (high growth doesn't mean high land use yet as countries started from small levels). Examples include Germany, which boosted production from first year figures of 43,200 tonnes reported in 2016 to 65,700 tonnes in 2017, and Bulgaria, with production increasing from 600 tonnes in 2013 to 20,000 tonnes in 2017.[167] Projections for agricultural development in the EU foresee an increase in domestic soybean production to 3.8 million tonnes in 2030. Based on a total use of 39 million tonnes of soybean equivalents in the EU+, this means that the domestic production of 2.7 million tonnes covers around 7% of the actual need based on current soy consumption figures and this share could increase to 10% by 2030.

Meanwhile, the gap between higher EU producer prices relative to world price is expected to widen due to growing domestic demand for non-GM, identity-preserved soybeans.[168] This demand is present in the feed industry (see section 4.2) and in the market for meat and dairy alternatives.[169]

Figure 16 Soy cultivation EU+, 2008 to 2017 (million tonnes)

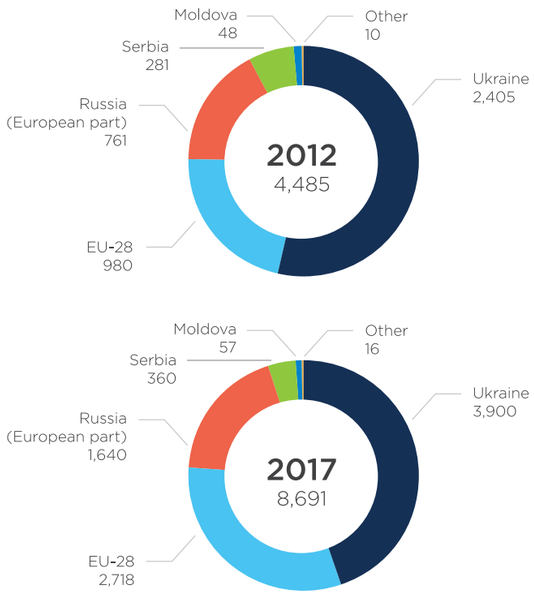


Source: *Eurostat* (n.d.), "Crop production in national humidity: soya".

4.2 SOY PRODUCTION ON THE EUROPEAN CONTINENT

When looking at a broader definition of Europe, including countries in the southeastern and eastern regions of the European continent, the cultivated area and production volumes in Europe are considerably larger, as illustrated in Figure 17.

Figure 17 Soybean cultivation on European continent, 2012 and 2017 (1,000 tonnes)



Source: DonauSoja (2018, November), *Statistics*.

Ukraine is by far the largest producer of soy in Europe, with production of 3.9 million tonnes in 2017. It is followed by the European part of Russia with 1.6 million tonnes (Figure 17). Notably, Ukraine exports a large share of its production. Ukraine reported a production of soybeans, -meal, and -oil totaling 4.9 million tonnes in 2017. With imports of around 11,000 tonnes, and domestic consumption accounting for 1.6 million tonnes, approximately 3.3 million tonnes were exported. The EU+ countries analyzed in this study imported 30% of exports of soybeans, -meal, and -oil from Ukraine in 2017.[170]

Among the FEFAC-SSG-compliant standards and programs, Donau Soja / Europe Soya[k] and ProTerra are relevant in European soy cultivation. As outlined in section 2.5.5, around 600,000 tonnes of soy were produced under Donau Soja / Europe Soya in 2018, and 64,000 tonnes under the ProTerra standard. This equaled approximately 7.6% of production on the European continent. In addition, an estimated 220,000 tonnes of soybean cultivation (based on average yields) were certified Organic in the EU+, and that number increases to 400,000 tonnes from the European continent as a whole.[171]

4.3 EU MARKET FOR SPECIAL FEEDSTUFFS: NON-GM AND ORGANIC FEED

The growth in soybean production and the search for alternative protein sources in the EU is driven by a strategy to increase self-sufficiency, as well as the preference for non-GM products in many countries. According to traders' estimates the EU non-GM soy market accounts for around 15% of the total feed-grade market, with a lower percentage for the Dutch market. Production of organic animal products has also continuously increased in recent years at average growth rates of 10%.[172] Some countries have a stronger preference for non-GM and organic (Austria, Germany, Norway, and Switzerland). Norway and Switzerland have commitments to import soy falling under ProTerra, non-GM RTRS, or Organic certification. Other countries accept non-GM assurance without additional requirements.

In the coming years, growing consumer concerns over environmental and animal welfare issues are expected to further segment the livestock feed market between conventional and premium feed. The latter category refers to locally produced, non-GM, and organic feed. For example, an expected increase in organic milk production on the EU-level from 3% in 2016 to 10% in 2030 would have considerable impact on the composition of feed rations and on the quantity and quality required. According to these estimates, EU soy farmers could charge a premium of €80 to €120 per tonne of non-GM soybeans.[173] Organic soy earns double this premium.[174]

k Due to the high-risk of Soy contamination in Ukraine, Donau Soja has additional requirements for sourcing including proof of exclusive use of 'original seed' and a contract for annual inspections with an accepted control body.

05

Amsterdam Declarations Partnership:

Country profiles

The signatories of the Amsterdam Declarations Partnership (ADP) committed to halting deforestation in agricultural commodity supply chains by 2020. There are considerable differences across the ADP countries with regards to the status of public and private initiatives aimed at halting deforestation in agricultural commodities and the soy supply chain. Similarly, adoption and purchasing of soy falling under one of the certification schemes and programs varies across ADP countries, with Norway and the Netherlands taking the lead.

The following sections summarize findings on the soy supply chain in the seven ADP countries based on best estimates, aiming to broadly quantify the trade of soybeans, -meal and -oil, as well as the consumption and trade of embedded soymeal in feed for livestock and the use of soybean oil in biodiesel production and consumption. All references to soy mean soybean meal unless otherwise indicated. 1 ton of soybean meal is the equivalent of 1.27 tonnes of soybeans. Soy use in direct food consumption could not be considered in detail due to smaller volumes and limited country-level data. It can be generally assumed that soybeans and soybean oil are present in food products like soymilk, tofu, and margarine. Both have limited use as feed ingredients, though soybean oil is also used in biodiesel and other technical applications.

5.1 DENMARK

5.1.1 Overview

Import: Denmark imported a total of 1.7 million tonnes of soybeans, - meal, and -oil in 2017, with soymeal accounting for 1.6 million tonnes. Top suppliers were Germany (33%) and Argentina (32%), followed by Brazil (11%) and Russia (4%). Germany in turn imports most soy from Brazil and the U.S.

Domestic soy cultivation: No soybeans are produced in Denmark.

Soymeal use in livestock production: After re-exports, a net volume of 1.5 million tonnes of soymeal was available for use in the Danish livestock industry in 2017. Pork production accounted for the largest share (48%).

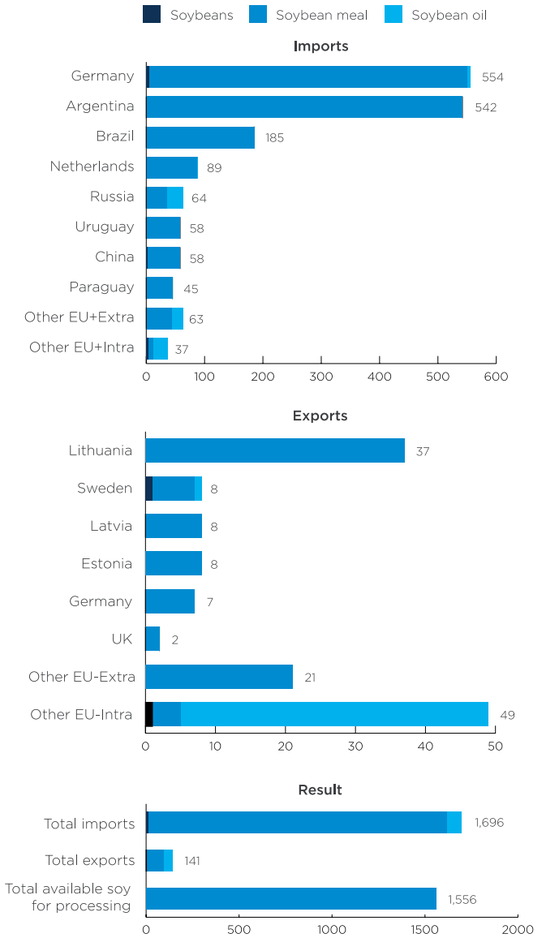
Domestic consumption: The Danish consumption of embedded soymeal in livestock products – both imported (339,000 tonnes) and locally produced – was estimated at 619,000 tonnes in 2017.

Export: An estimated 1.2 million tonnes of embedded soymeal were exported in livestock products from Denmark in 2017. ADP countries accounted for a 43% share (539,000 tonnes) of those exports.

Compliance: At least 29% of the soy used in Denmark was FEFAC SSG compliant in 2017, including 310.000 RTRS credits bought by Arla.

5.1.2 Soy trade, use and consumption

Figure 18 Danish imports and exports of soy, 2017 (1,000 tonnes)



Note: Differences in net available soybeans, -meal, and -oil are due to losses and stock mutations.

Eurostat (n.d.), "International trade in goods – detailed data", online: https://ec.europa.eu/eurostat/data/database

See Figures 19 and 20 for embedded soymeal used for livestock production and in exported livestock products. Domestic biodiesel production in Denmark reached an estimated 90,000 tonnes in 2017.[175] Reportedly, no soybean oil was used as feedstock in Danish biodiesel production.[176] It is unclear whether any soybean oil was embedded in Danish biodiesel consumption. However German biodiesel production

used around 8% soybean oil in 2017, and Germany supplied 52% of the 92,485 tonnes of total biodiesel imports to Denmark in 2017. No direct imports of soy-based biodiesel from Argentina were reported.[177]

5.1.3 Share of compliant soy in Denmark

According to national statistics, 660,000 tonnes of soymeal was used in compound feed in 2017, and 712.000 tonnes as raw material feed component at farm level, especially by dairy and pig producers. Calculations based on net available soymeal in Denmark in 2017 result in a slightly higher total volume of soymeal used in animal feed – 1.5 million tonnes.

Based on the net available soybeans, -meal, and -oil, at least 29% of the used soy in Denmark was FEFAC-SSG compliant (DAKOFO). According to information from feed chain partners, a large part of the soy import to Denmark is sourced with reference to the FEFAC Soy Sourcing Guidelines.

Due to confidentiality issues there is no public data available on the different schemes and suppliers. However, according to RTRS reporting, Danish dairy producer Arla Foods purchased 310,000 RTRS credits in 2017 and 270,000 credits in 2018, making it the single biggest Danish buyer. Between 2014 and 2017, Arla Foods states that it covered the full volume of soy used on Arla Farms and as ingredients in its products with organic soy, ProTerra-certified soy, or RTRS credits.180

HKScan, a Nordic meat producer with poultry production in Denmark, committed to 100% RTRS or ProTerra soy from 2019. In 2017, HKScan Denmark reported 25% of soy use covered by RTRS with an increase to 30% in 2018.181 The parent company purchased 61,218 RTRS credits in 2017 and 54,086 credits in 2018, however it is not clear for which market.

In 2017, Lidl (Denmark, Belgium, Netherlands, Sweden, and Finland) bought RTRS Direct Trade credits for eggs, meat, poultry, and dairy products. The Direct Trade commitment means that Lidl chooses two farms that it directly supports with the purchase of the RTRS credits.182 Total Lidl purchases of RTRS reached 76,820 credits in 2017, and 211,746 credits in 2018. It is unclear how much of this was relevant for the Danish market.

5.1.4 Initiatives for improved sustainability in soy sourcing

The Danish Agriculture & Food Council, representing the farming and food industries of Denmark, developed six procurement criteria for soy of which two relate to deforestation in 2014. Dakofo, representing the entire feed industry, is a signatory. The initiative focuses on removing illegal deforestation from the soy supply chain. It has formulated six soy purchasing criteria for South American soy, and puts the onus on trading partners to take responsibility. In relation to deforestation, the criteria ask for adherence to the Soy Moratorium and rely on legal compliance.[178]

The Danish Ethical Trading Initiative (DIEH) convened a working group on soy in March 2017 that principally serves as a dialogue platform for stakeholders to share information and cross-commodity experiences.[179] Members include the Ministry of the Environment and Food, retailers, industry organizations, and civil society organizations (WWF, NEPCON). No commitments in relation to sourcing compliant soy and eliminating deforestation from supply chains have been reached yet.[180]

5.1.5 Replacement of soy imports

No soy is grown in Denmark. Reportedly the German seed company Saaten Union is trying to develop soybean seeds that are adapted to the growing conditions in a Nordic country like Denmark. These are early varieties that need fewer growth days.[181]

Denmark is among the EU-28 countries that have introduced initiatives to promote the production of alternative plant proteins. The Det Nationale Bioøkonomi Panel (Danish National Bioeconomy Panel), an advisor to the government, published its recommendations on the Future of Proteins in spring 2018.[182] The Danish Ministry of the Environment and Food launched a Protein Action Plan in October 2018 following the panel's recommendations.[183] In January 2019, the Danish Protein Innovation was launched as a new broad collaboration aimed at targeting and intensifying development and research on domestic production of protein for feed, food, and pharma.[184]

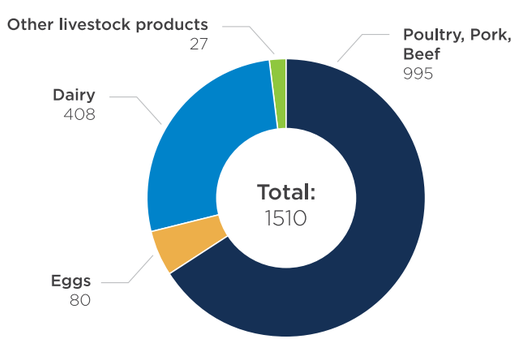
5.1.6 Non-GM market

Twenty-two Danish animal feed companies are certified under the GM-free standards of VLOG (see section 5.3.6).[185] There is no current data on the share of non-GM feed in Denmark.[186]

In its 2018 report, the National Bioeconomy Panel reported an increased demand for GM-free dairy in Denmark (demand for combined conventional non-GM and organic dairy products).[187] Leading dairy producer Arla[l] announced in 2016 that it would begin to incentivize more farmers to convert to GM-free feed. This decision was taken in response to an increase in market willingness to pay a price premium, and the expectation that the demand by European retailers for GM-free dairy products will further increase. The immediate demand for GM-free milk was estimated at up to 1 million tonnes per year (requiring approximately 77,000 tonnes of GM-free soymeal), with farmers receiving an additional one eurocent in compensation per kg of milk.[188] At an average premium of €100 per tonne of GM-free soy, and estimated use of 75g of soy per kg of milk, this compensation is adequate.

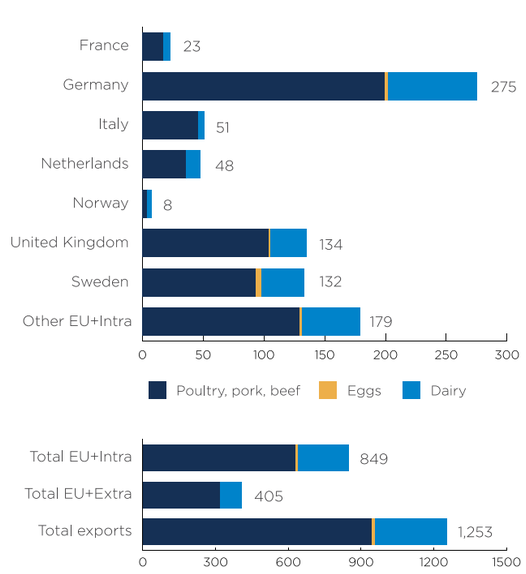
l Headquartered in Denmark and owned by farmers in Denmark, Sweden, the UK, Germany, the Netherlands, Luxembourg, and Belgium.

Figure 19 Embedded soymeal in livestock production in Denmark, 2017 (1,000 tonnes)



Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs, and livestock production.

Figure 20 Embedded soymeal in livestock products exported from Denmark in 2017 (1,000 tonnes)



Note: Differences between total net exports and consumption of embedded soymeal due to rounding, losses, and stock changes. Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs and livestock production.

5.2 FRANCE

5.2.1 Overview

Import: France imported a total of 3.5 million tonnes of soybeans, -meal, and -oil, with soymeal accounting for 2.9 million tonnes. The largest share of the imported soy, 2.0 million tonnes, originated from Brazil. The crushing of 794,000 tonnes of the soybeans resulted in an additional 623,000 tonnes of soymeal.

Domestic soy cultivation: French domestic soy cultivation produced 414,000 tonnes of soy in 2017.

Soymeal use in livestock production: After re-exports, a net 3.4 million tonnes of soymeal was available for the French livestock industry in 2017.

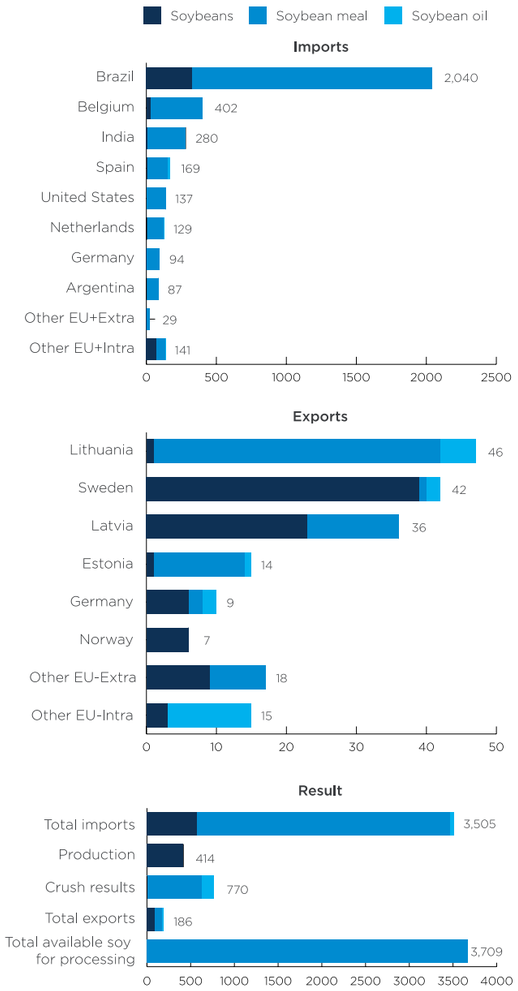
Domestic consumption: The French consumption of embedded soymeal in livestock products – both imported (836,000 tonnes) and locally produced – was estimated at 3.3 million tonnes in 2017. It is likely that some soybean oil was embedded in French biodiesel consumption.

Export: An estimated 944,000 tonnes of embedded soymeal were exported in livestock products from France. ADP countries accounted for a 34% share.

Compliance: An estimated 19% of the soy used in France was FEFAC-SSG compliant in 2017. The share of deforestation-free schemes was at least 6% of total soy use in 2017.

5.2.2 Soy trade, use, and consumption

Figure 21 French imports, production, and exports of soy, 2017 (1,000 tonnes)



Note: Differences between net available soybeans, -meal, and -oil are due to losses and stock mutations.

Eurostat (n.d.), "International trade in goods – detailed data", online: https://ec.europa.eu/eurostat/data/database

See Figures 22 and 23 for embedded soymeal used for livestock production and in exported livestock products. With a total production of 1.7 million tonnes, France was the second largest biodiesel producer in the EU in 2017, after Germany.[189] The most recent overview of feedstock composition in French biodiesel consumption published by the French Environment Ministry (2015) reported 2.3% of the feedstock was soybean oil, while palm oil accounted for 13.7%.[190] Based on a total of 1.6 million tonnes of biodiesel for domestic consumption in 2015, this equaled approximately 37,000 tonnes of soybean oil used in biodiesel. Total's bio-refinery opened in 2018 with an annual processing capacity of 650,000 tonnes, for which it announced plans to source up to 70% of crude vegetable oils, including among others soybean and palm oil.[191]

French imports of biodiesel added up to 1 million tonnes in 2017, while 340,100 tonnes were exported. Almost all imports came from intra-EU partners, with the largest shares originating from Spain (29%), the Netherlands (27%), and Belgium (26%). No direct imports of biodiesel from Argentina were reported, however the country's three main suppliers in the EU+ are the leading importers of biodiesel from Argentina.[192]

5.2.3 Share of compliant soy

The European coalition of French animal feed producers, Eurofac (comprised of three feed associations: l'AFCA-CIAL, Coop de France Nutrition Animale, and SNIA), reported soymeal usage in compound feed of 3.3 million tonnes in 2017.[193] According to the association, around 700,000 tonnes were compliant with FEFAC-SSG (non GMO certificates, ProTerra). This represents an estimated 19% of the total soybeans, -meal, and -oil processed in France that year. No detailed breakdown by schemes is available.

On average, 150,000 to 200,000 tonnes of physical ProTerra-certified soy were used in the French market in recent years.[194] According to RTRS reporting, France-based companies purchased 74,400 credits in 2017, most of them accounted for by dairy company Fromagerie Bel (72%). In 2018, 107,575 RTRS credits were purchased by French companies, with poultry processor Moy Park France accounting for 45% and Fromagerie Bel for 44%.[195] In addition, an unknown share of the domestic French harvest was presumably consumed domestically, including around 70,000 tonnes of organic soy. The share of other production schemes is not known.

Based on the estimated volumes of RTRS and ProTerra purchases in 2017, at least 6% of the soy used in France in 2017 was certified under a deforestation-free scheme. Due to increased RTRS credit purchases, this share was likely higher in 2018.

5.2.4 Initiatives for improved sustainability in soy sourcing

The French 'National Strategy to Combat Imported Deforestation' (Stratégie Nationale de Lutte Contre la Déforestation Importée (SNDI)) was adopted in November 2018. It is based on the results of the National Group on Tropical Forests (GNFT), which will lead its implementation. The Strategy aims to put an end to the imports of agricultural commodities that drive deforestation by 2030 and is part of its ADP commitment (including soy). The Strategy will include development aid assigned to advance roadmaps with developing countries, the establishment of a national platform to monitor and support the implementation of private sector zero-deforestation commitments, and a zero-deforestation public purchasing policy by 2022. The measures are currently non-binding, however the strategy will give progress reports in 2020 and 2025 and consider adding binding measures in the future if necessary.[196] Civil society organizations criticized the Strategy for its reliance on voluntary commitments and the ongoing allowance of first-generation biofuels.[197]

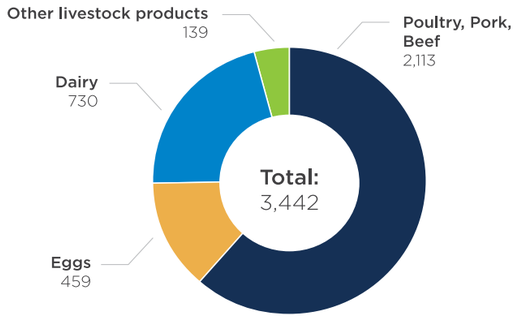
Within the GNFT, private actors involved in supply chains affecting forests were represented by the group *Alliance pour la Préservation des Forêts*, which holds a seat in the governing body of the SNDI as a private sector representative. Its mission is to serve as a platform for interaction and collaboration between private actors and stakeholders from different supply chains, and to support the implementation of landscape approaches.[198] Its members are committed to achieving zero deforestation and zero destruction/conversion of outstanding natural ecosystems in key agricultural commodity supply chains, and to address social issues related to agricultural supply chains. This is done in line with commitments under the Paris agreements, the United Nations Sustainable Development Goals (SDGs), the New York Declaration on Forests, and the Amsterdam Declaration.[199]

In 2016 the French animal feed associations Coop de France Animal Nutrition and SNIA convened all stakeholders in the French animal feed and livestock sector interested in feed sustainability via the collaborative *Duralim* platform. Stakeholders are companies or professional associations from the French animal feed and livestock sector ranging from raw materials producers to animal products retailers. It currently has 70 members from all levels of the supply chain. The participants sign a charter that includes *"9 commitments for sustainable feeding of livestock"* and discuss options how to achieve this goal.[200] In 2018, the Duralim collaborative agreed on a goal to *"[…] reach,100% of sustainable supply with a zero deforestation target by 2025"*. Duralim also initiated a working group to define '100% sustainable' and 'zero deforestation'.[201] In relation to 'deforestation', the group agreed to a multi-step approach– committing to ensuring the absence of illegal deforestation for all imports by 2020, and zero gross deforestation by 2025. The initial focus is on soy and palm oil as key commodities in relation to deforestation, however Duralim aims to work on all raw materials regardless of origin. An additional target to reach *"no-natural ecosystems conversion"* by 2030 has been added at the request of members in order to align goals with the National Strategy.[202]

5.2.5 Replacement of soy imports

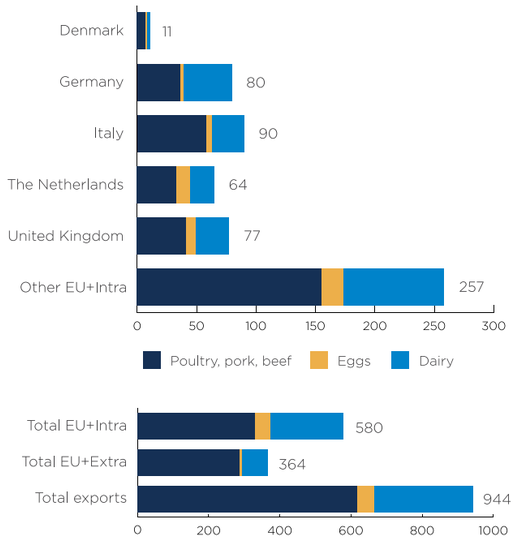
France reported a total soy production of 414,000 tonnes in 2017, a year-over-year increase of 21%, and approximately six times greater than ten years ago. This represented 15% of total EU+ production, and made

Figure 22 Embedded soymeal in livestock production in France, 2017 (1,000 tonnes)



Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs, and livestock production.

Figure 23 Embedded soymeal in key livestock products exported from France in 2017 (1,000 tonnes)



Note: Differences between total net exports and consumption of embedded soymeal due to rounding, losses, and stock changes.

France the second biggest EU+ producer behind Italy.[203] 25,000 hectares (17%) of French soybean cultivation area was organic in 2017.[204] Around 10,000 hectares of soybean cultivation area were under conversion to organic production.[205]

France has a target of producing 500,000 hectares of protein crops by 2022. Alongside these growth goals, the country aims to reduce pesticide use and greenhouse gas emissions. The Strategy centers on research and innovation, and the use of commodity certification schemes.[206]

In relation to this goal, the 'Charte Soja de France' was launched in April 2018 by Terres Univia, an organization bringing together the main actors involved in production, marketing, and use of oil seeds and protein-rich plants. It aims to unite seed producers, farmers, collectors, and processors who are committed to local origin, non-GM, traceability, and sustainability for soy. The goal is to reach 250,000 hectares of soy in France by 2025 to supply the French market.

The SNDI and Duralim have a vision of achieving protein autonomy for the country (without banning imports). To break dependence on protein imports, the plan is to implement a national protein strategy for food and feed, and to promote alternatives to the importation of crop proteins causing deforestation compatible with an agro-ecological transition.[207]

5.2.6 Non-GM market preference

France is a consumer market with comparatively high demand for non-GM raw materials for animal feed. According to estimates by the animal feed industry, non-GM soy accounts for about 15% of the soymeal market.[208] In 2017, the French feed industry developed OQUALIM, a certification standard for the manufacturing and trade of animal feeds meeting GMO-free feed or GMO-free fed animals specifications. In 2018, 176 French compound feed plants were certified.[209] OQUALIM-STNO is compliant with the GM-free standards of VLOG (see section 5.3.6).[210] Demand for GM-free soy is covered partly by domestic soy cultivation as well as ProTerra-certified soy (see section 5.2.3).

Several French meat and dairy companies offer products labeled GM-free.[211] For example, Carrefour has a wide range of products and has had GM-free policies since 1998. In Europe, none of its own-brand food products directly contain GMOs or derivatives. Carrefour has committed to GM-free feeding of animals used for its name-brand fresh products (milk, chicken, eggs, pork, veal, and farmed fish), and has developed a traceable GM-free soymeal network through the use of products like known-origin ProTerra soy in feed.[212] Some Carrefour eggs and chicken even come from poultry fed with French soy. The company names a price differential of around 10 to 15% for the consumer.[213]

5.3 GERMANY

5.3.1 Overview

Import: Germany imported a total of 5.8 million tonnes of soybeans, -meal, and -oil, with soymeal accounting for 2.7 million tonnes. The largest share of this volume originated from Brazil (1.6 million tonnes). The crushing of 3.2 million tonnes of the soybeans resulted in an additional 2.5 million tonnes of soymeal.

Domestic soy cultivation: Germany reported domestic soybean production of 66,000 tonnes in 2017.

Soymeal use in livestock production: After re-exports, a net volume of 3.7 million tonnes of soymeal was available for the German livestock industry in 2017.

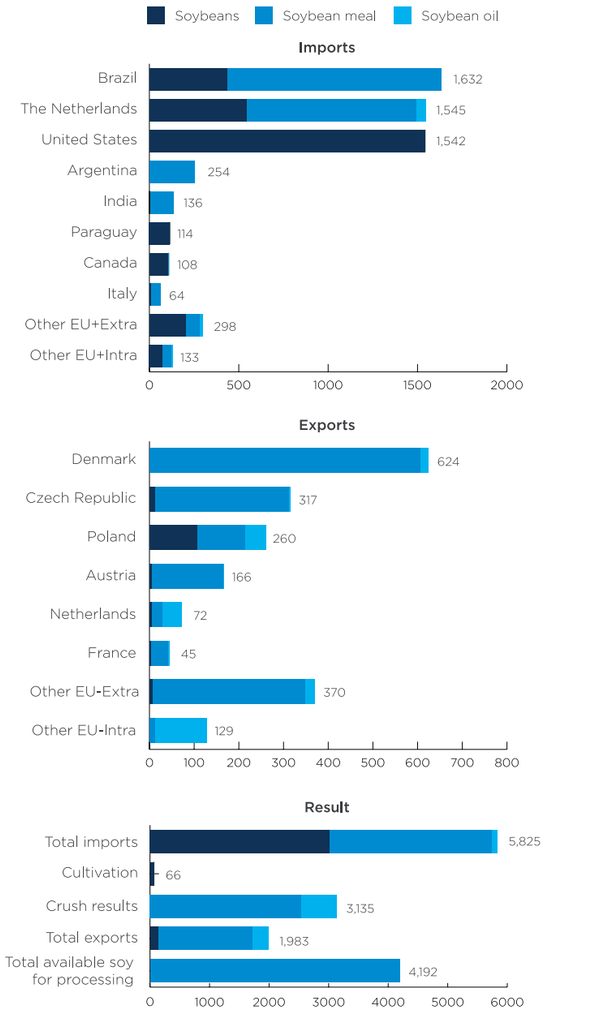
Domestic consumption: The German consumption of embedded soymeal in livestock products – both imported (1.6 million tonnes) and locally produced – is estimated at 3.5 million tonnes in 2017. In biodiesel production, soybean oil use reached 248,000 tonnes in 2017, while domestic biodiesel consumption contained about 2,000 tonnes of soybean oil.

Export: An estimated 1.8 million tonnes of embedded soymeal were exported in livestock products from Germany. ADP countries accounted for a 51% share.

Compliance: An estimated 45% of the soybeans, -meal, and - oil used in the Germany was FEFAC-SSG compliant in 2017. Deforestation-free certification accounted for at least 16% of the total use.

5.3.2 Soy trade, use, and consumption

Figure 24 German imports, production, and exports of soy, 2017 (1,000 tonnes)



Note: Differences between net available soybeans, -meal and -oil are due to losses and stock mutations.

Eurostat (n.d.), "International trade in goods – detailed data", online: https://ec.europa.eu/eurostat/data/database

See Figures 25 and 26 for embedded soymeal used for livestock production and in exported livestock products. Germany produced around 3.1 million tonnes of biodiesel in 2017, making it the biggest producer of the EU+ countries. According to industry estimates,

feedstock for biodiesel production included 8% soy and 7% palm oil. This represented about 248,000 tonnes of soybean oil and 217,000 tonnes of palm oil.[214] No direct imports of biodiesel from Argentina to Germany were reported in 2017.[215]

Domestic German consumption of biodiesel reached 2.1 million tonnes in 2017. According to the latest figures collected by the German Federal Office for Agriculture and Food, the use of soy oil in biodiesel consumption in Germany has decreased continuously in recent years. While 22,000 tonnes of soybean oil were used as feedstock in 2014, this volume has decreased to single-digit figures since then. For 2017, a consumption of 2,000 tonnes was reported. Meanwhile, the use of palm oil in biofuel consumption increased, from 424,000 tonnes in 2014 to 523,000 tonnes in 2017.

These differing figures on feedstock composition in production and consumption suggest that exports of biodiesel produced in Germany contain higher shares of soybean oil as feedstock than the biodiesel used for domestic consumption.

5.3.3 Share of compliant soy

Based on figures by the Federal Office for Agriculture and Food (BLE), the German Feed Association (DVT) reported soymeal usage in compound feed of 2.7 million tonnes in 2017. Of this total, DVT reported that 1.9 million tonnes were compliant with the FEFAC-SSG. No further breakdown by scheme is available.[216] Calculations based on net imports to Germany in 2017 suggest a higher total volume of soymeal used in animal feed – almost 3.7 million tonnes.[217] Part of this difference may be due to home mixing, but no full explanation for the discrepancy could be found.

Based on these estimates, FEFAC-SSG compliant soy accounted for at least 45% of the total soybeans, -meal, and -oil processed in Germany in 2017. The feed industry highlighted the production of GM-free soy as an important topic for the market (see section 5.3.6).[218]

According to RTRS reporting, German animal feed producers purchased 49,864 credits in 2017, and 32,180 credits in 2018. In addition, traders, food manufacturers, and retailers purchased 106,120 RTRS credits in 2017, and 267,117 credits in 2018. Discounter Lidl accounts for the largest share of credits purchased (49% in 2017, and 71% in 2018).[219] In addition, it must be considered that Germany is a key market for ProTerra certified GM-free soy. For 2018, ProTerra reported physical sales to Germany of 243,953 tonnes of certified soy.[220] However, this number does not take into account likely transshipments from the Netherlands to Germany. Based on stakeholder feedback, a conservative estimate of 500,000 tonnes of ProTerra soymeal is used in this report. In total, this suggests that deforestation-free soy made up a minimum of 16% of soy used in Germany in 2017. This does not consider likely purchases of Donau Soja / Europe Soya and ISCC+.

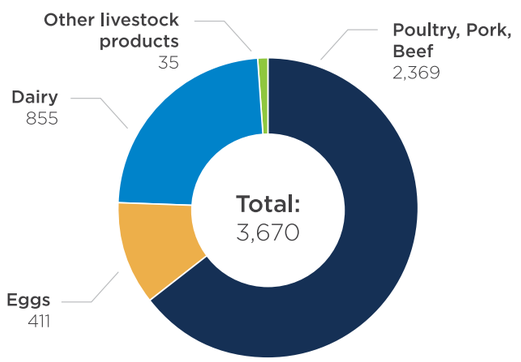
Most leading German retailers have taken initiatives to partly introduce RTRS/ProTerra-certified soy or local/European protein feedstuffs into their products, however no complete overview is available.[221] Discount store chain Lidl launched its 'Soja-Initiative' in January 2018. Lidl retail activities in Germany, Austria, and Switzerland will require suppliers use exclusively ProTerra-certified non-GM soy in the production of pork and beef products. This will amount to an estimated total of 147,000 tonnes of soy. In cooperation with the ProTerra Foundation, select farms in Brazil will be supported with seven-digit sums over the next three years to increase the quantity of certified soy available in Europe.[222]

5.3.4 Initiatives for improved sustainability in soy sourcing

Since 2018, the Federal Office for Agriculture and Food has coordinated the Forum Nachhaltigere Eiweissfuttermittel (Forum on More Sustainable Protein Feeds). Members include government, research institutions, industry associations, and other private sector representatives. One of the goals of the Forum is to reach 100% certified soy use in animal feed, however no timeline or common action plan have been developed. According to the Forum members, there is not one certification system that sufficiently fulfills all ecological, social, and economic criteria for sustainability. There is an ongoing discussion about the definition of minimum requirements.[223] A deforestation benchmark of the FEFAC-SSG compliant schemes and programs was commissioned in 2018 to provide guidance under the ambitions of the Amsterdam Declaration.[224]

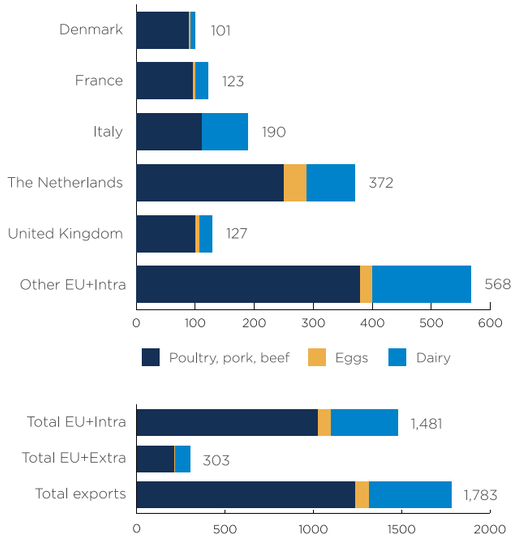
Forum members from the animal feed, livestock production, and retailing sectors have published individual statements with different levels of soy-related commitments. Optimizing feed ratios (substituting raw materials) is seen as one means of reducing soy content in feed. Substituting overseas soy imports with domestic or European protein is another option.[225]

Figure 25 Embedded soy in livestock production in Germany, 2017 (1,000 tonnes)



Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs, and livestock production.

Figure 26 Embedded soymeal exports in livestock products from Germany in 2017 (1,000 tonnes)



Note: Differences between total net exports and consumption of embedded soymeal due to rounding, losses, and stock changes.

Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs, and livestock production.

An example of a retailer initiative is the cooperation between EDEKA and WWF. EDEKA committed to switching to domestic/European feed or GM-free certified soy in its pig, cattle, and poultry feed. This refers to physical supplies of RTRS+GMO-free, ProTerra-certified soy, or Donau Soja / Europe Soya. The goal is for 85% of EDEKA dairy products to align with these goals by 2020. In the case of meat and sausage, an implementation concept is still being developed.[226]

5.3.5 Replacement of soy imports

The area under soy cultivation increased from 15,800 hectares in 2016 to 19,100 hectares in 2017. Preliminary figures for 2018 show a further increase to 24,100 hectares. This resulted in a total yield of 65,700 tonnes in 2017.[227] As of 2016, organic cultivation accounted around 3,500 hectares of cultivated area (22%).[228]

In 2012, the German Ministry for Food and Agriculture launched a protein crop strategy. Its objective is to improve ecosystem performance and resource protection, strengthen regional value chains, eliminate competitive disadvantages, and support the production of GM-free protein crops. The 2018 national budget dedicated €6 million to implementing this strategy.[229] The national plan (partly based on EU policy measures) includes a network of organic and conventional demonstration farms for soy, peas, and lupins where varieties are tested and knowledge is shared. Stakeholder dialogues on more sustainable protein feed are also organized under the plan.[230]

5.3.6 Non-GM market preference

Germany is an important market for GM-free produce. The Verband Lebensmittel Ohne Gentechnik (Asssociation for GM-free food products, or VLOG) awards the licenses for use of the "Ohne GenTechnik" (non-GM) label for use on food products that meet its standard, and "VLOG geprüft" for animal nutrition. VLOG has an exclusive agreement with the German Federal Ministry of Food and Agriculture (BMEL) to license the use of the "Ohne GenTechnik" seal to industry users.[231] Non-GM soy includes soy certified under pure non-GM certifications as well as soy certified under schemes with broader sustainability criteria such as organic, ProTerra, RTRS GM-free, or Donau Soja.

According to figures published by the animal feed industry in 2018, approximately 60% of poultry feed is GM-free, followed by cattle feed with 40%. For pork the share is much lower, but retailers are beginning to offer GM-free products.[232] Meanwhile milk certified as GM-free by VLOG reached a market share of more than 40%. The share of GM-free feed for eggs is also very high at around 70%. In both the egg and dairy sector there are extra efforts to increase the share of alternative protein sources. According to VLOG information, around 9,000 products on the German market are labeled GM-free, generating revenue of approximately €7 billion.[233] Some of these GM-free products, like ProTerra-certified production in the Netherlands, are imported.[234]

5.4 ITALY

5.4.1 Overview

Import: Italy imported a total of 3.6 million tonnes of soybeans, -meal, and -oil, with soymeal accounting for 2.2 million tonnes. The largest share of this volume originated from Argentina with 1.8 million tonnes. The crushing of 2.1 million tonnes of the soybeans resulted in an additional 1.6 million tonnes of soymeal.

Domestic soy cultivation: Italian domestic cultivation produced 1 million tonnes of soy in 2017.

Soymeal use in livestock production: After re-exports, a net 3.7 million tonnes of soymeal was available for the Italian livestock industry in 2017.

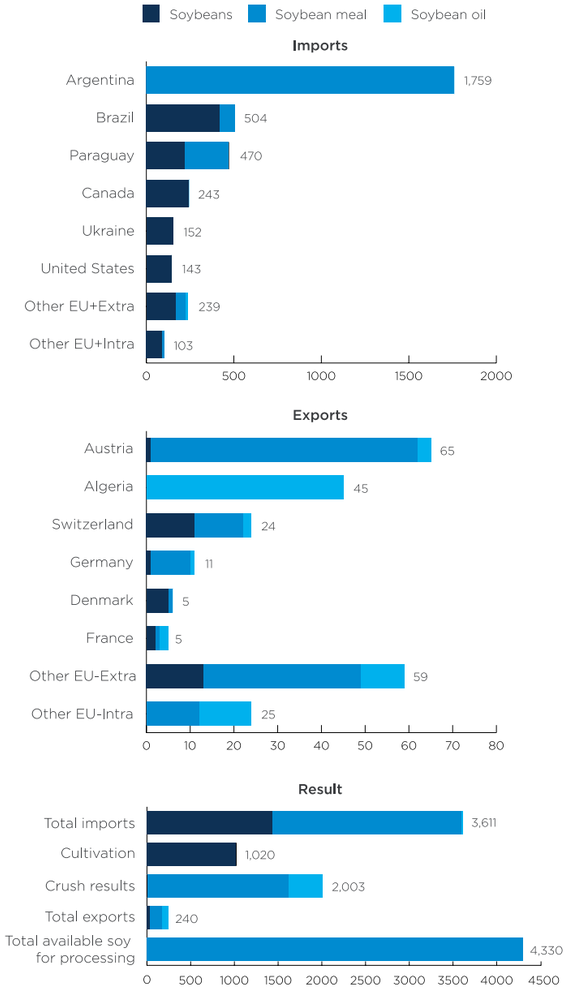
Domestic consumption: The Italian consumption of embedded soymeal in livestock products – both imported (929,000 tonnes) and locally produced – is estimated at 4.1 million tonnes in 2017. Biodiesel consumption in Italy used 13,100 tonnes of soybean oil.

Export: An estimated 528,000 tonnes of embedded soymeal were exported in livestock products from Italy. ADP countries accounted for 39% of embedded soy in exports.

Compliance: Based on the available information, an estimated 3% of the soybeans, -meal, and -oil used in Italy was FEFAC-SSG compliant and deforestation-free in 2017. The share of ProTerra and Donau Soja/ Europe Soya certification is estimated to be 14%, or 140.000 tons.

5.4.2 Soy trade, use, and consumption

Figure 27 Italian imports, production, and exports of soy, 2017 (1,000 tonnes)



Note: Differences between net available soybeans, -meal, and -oil are due to losses and stock mutations.

Eurostat (n.d.), "International trade in goods – detailed data", online: https://ec.europa.eu/eurostat/data/database

See Figures 28 and 29 for embedded soymeal used for livestock production and in exported livestock products. Italian production of biodiesel reached around 400,000 tonnes in 2017.[235] An estimated 1,000 tonnes of soybean oil was used as feedstock in this production. According to the Gestore Servizi Energetici (GSE) a total of 1.16 million tonnes of biodiesel was consumed in Italy in 2017. Of this total, soybean oil accounted for 13,102 tonnes (1.1%), mostly embedded in biodiesel imported from Spain.[236] In the same year 137,534 tonnes of palm oil were embedded in biodiesel consumption (12%).[237]

5.4.3 Share of compliant soy

The Italian association of animal feed producers (ASSALZOO) does not collect data on purchases of certified soy, and the Italian market has not shown strong interest in FEFAC-SSG compliant soy.[238] However, an estimated 110.000 tons of Proterra were imported in 2017. According to RTRS reporting, Italian poultry company Amadori purchased 3,500 RTRS credits in 2017, and 15,000 credits in 2018.[239]

In addition, an estimated volume of 40.000 tons of domestic production is Donau Soja/ Europe Soya certified. The precise number is unclear. A national producer scheme (CSQA) is currently being benchmarked, greatly increasing Italy's compliance figures in the future, as 2018 production totalled 500.000 tons. Soymeal certified under these schemes is used in non-GM chicken, pork, and dairy cattle feed and exported to other markets.[240]

5.4.4 Initiatives for improved sustainability in soy sourcing

No public or private soy-specific action exists in Italy at this point.[241]

5.4.5 Replacement of soy imports

Italy led soy production in the EU, growing soy on 322,000 hectares in 2018, and achieving a harvest of slightly more than 1 million tonnes. Production has rapidly increased in recent years, up from 422,000 tonnes produced in 2012.[242] Cultivation is concentrated in the Northern part of the country.[243] Cultivation conditions in Italy allow farmers to grow a second harvest of soy following a straw cereal, with the option of sowing without first working the soil.[244]

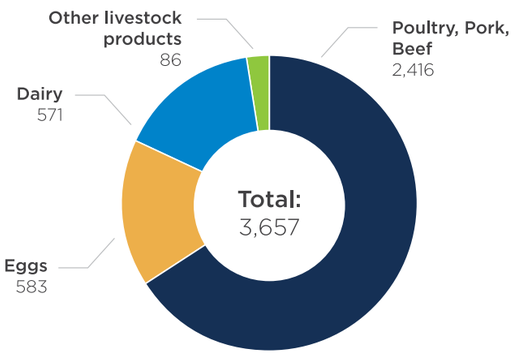
As of 2016, organic soy cultivation accounted for around 8,360 hectares (3%), with 3,100 hectares under conversion to organic production.[245]

5.4.6 Non-GM market preference

Various livestock production companies as well as retailers have made non-GM commitments. In 2001, the Province of South Tyrol became the first GM-free dairy region in Europe.[246] Retailer Coop Italia guarantees non-GM feed use for all brand-name meat, fresh milk, and eggs sold in its stores.[247] It is not clear how much of the GM-free production is based on the use of compliant soy.

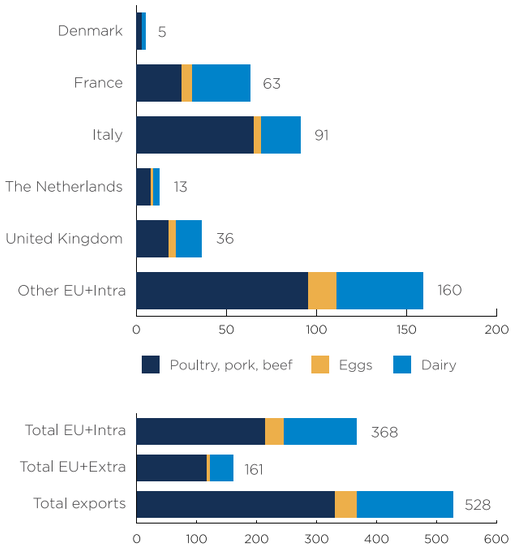
Three Italian animal feed producers are certified under VLOG's GM-free standards, largely to satisfy demand from other European markets (see section 5.3.6).[248] As mentioned in section 5.4.3, GM-free feed certified under SSG-compliant standards is used in Italy, however no volumes are known. In addition, the Italian industry uses the technical standard RT-11 as a minimum requirement for non-GM certification of products.[249]

Figure 28 Embedded soy in livestock production in Italy, 2017 (1,000 tonnes)



Profundo calculations based on trade statistics, estimated soy content in compound feedstock production.

Figure 29 Embedded soymeal exports in livestock products from Italy in 2017 (1,000 tonnes)



Note: Differences between total net exports and consumption of embedded soymeal due to rounding, losses, and stock changes.

Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs, and livestock production.

5.5 NETHERLANDS

5.5.1 Overview

Import: The Netherlands is the leading importer and re-exporter of soy in Europe. In 2017, it imported a total of 7.0 million tonnes of soybeans, -meal, and -oil, with soymeal accounting for 3.1 million tonnes. The largest share of imported soy originated from Brazil (3.3 million tonnes), followed by the U.S. (1.9 million tonnes). The crushing of 2.9 million tonnes of the soybeans resulted in an additional 2.3 million tonnes of soymeal.

Domestic soy cultivation: Dutch domestic soy cultivation produced 1,000 tonnes in 2017.

Soymeal use in livestock production: After re-exports, a net volume of 2.1 million tonnes of soymeal was available for the Dutch livestock industry in 2017.

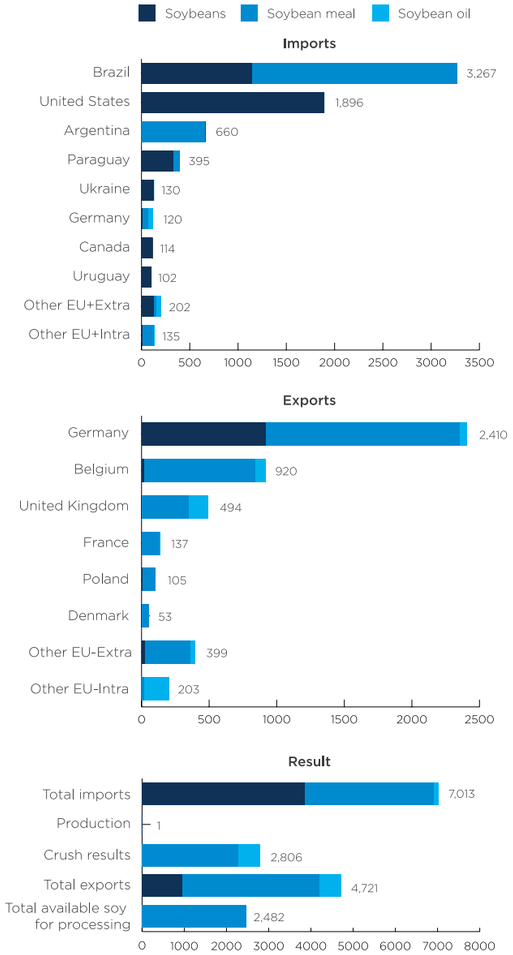
Domestic consumption: The Dutch consumption of embedded soymeal in livestock products – both imported (1.1 million tonnes) and locally produced – is estimated at 953,000 tonnes in 2017. No soybean oil was used as feedstock in domestic biodiesel consumption.

Export: An estimated 2.2 million tonnes of embedded soymeal were exported in livestock products from the Netherlands. ADP countries accounted for about 53% of embedded soy in exports of livestock products from the Netherlands.

Compliance: At least 83% of the soybeans, -meal, and -oil used in the Netherlands in 2017 was FEFAC-SSG compliant. Deforestation-free certification accounted for at least 50% of overall use. Domestic consumption of embedded soymeal in livestock products was entirely covered by RTRS-purchases in 2017.

5.5.2 Soy trade, use, and consumption

Figure 30 Dutch imports, production, and exports of soy, 2017 (1,000 tonnes)



Note: Differences between net available soybeans, -meal, and -oil are due to losses and stock mutations.

Eurostat (n.d.), "International trade in goods – detailed data", online: https://ec.europa.eu/eurostat/data/database

See Figures 31 and 32 for embedded soymeal used for livestock production and in exported livestock products. Total production of biodiesel reached around 500,000 tonnes in 2017.[250] No soybean or palm oil has been used as feedstock in Dutch biodiesel consumption since 2016.[251] Dutch imports of biodiesel summed to 2.2 million tonnes in 2017, while 2.3 million tonnes were exported. Significant volumes of biodiesel were imported from Malaysia (13%, palm oil-based) and Argentina (9%, soybean oil-based). Key export destinations for biodiesel from the Netherlands are Germany (26%), Belgium (25%), France (16%), and the UK (15%).[252]

5.5.3 Share of compliant soy

According to the Dutch animal feed association (Nevedi), the Dutch compound feed industry processed 2.0 million tonnes of soy products (including hulls) in 2017. Total FEFAC-SSG compliant soy purchases covered 98% of the soymeal processed in the Netherlands. Of this total, deforestation-free standards accounted for at least 59% in the form of 1.2 million RTRS credits.[253] FEFAC-SSG compliant soy accounted for 83% of overall use of soybeans, -meal, and -oil in the Netherlands, and deforestation-free soy accounted for at least 50% of overall use.

It is likely that ProTerra soy was used in the Netherlands in 2017. In 2018, ProTerra reported physical imports of 1.2 million tonnes to the Netherlands.[254] It is unclear how much of this volume stayed in the country, and what share was re-exported (Germany was a major export destination). In addition, an unknown share of the ProTerra soy that remained in the Netherlands was used for livestock produced for the German market (see section 5.3.3).

Based on a domestic consumption of 953,000 tonnes of soymeal embedded in livestock products, the RTRS credits purchased by the Dutch animal feed industry in 2017 were sufficient to cover 100% of the domestic consumption, as well as an estimated 22% of embedded soy in exports of Dutch meat, dairy, and eggs.

Based on total purchases of 2.6 million RTRS credits in 2017 by Netherlands-based companies, it is clear that 1.4 million RTRS credits were bought by companies outside the animal feed industry. This volume means that Netherlands-based companies were the most important buyers of RTRS soy overall. However, these credits cannot necessarily be assigned to the Dutch market. Important buyers include commodity traders with operations for import and re-export via the port of Rotterdam. In addition, companies registered in the Netherlands may have purchased credits for foreign activities.[255]

Most of the soybeans, -meal, and -oil imported to the Netherlands (67%) was directly (or after the crushing/refining process) exported to other European countries. For this soy it is not clear what share was compliant with FEFAC-SSG or deforestation-free standards.

5.5.4 Initiatives for improved sustainability in soy sourcing

In 2010, with the support of the Dutch Government and civil society (including the Dutch Soy Coalition group of NGOs), a coalition of soy users committed to reaching 100% RTRS (or equivalent) soy for all imports into the Netherlands by 2015. This ambition was revised in 2014 to narrow the commitment to RTRS-certified soy for domestic consumption of animal products. The revised commitment allowed for use of FEFAC-SSG compliant soy in animal products destined for markets lacking demand for RTRS soy. The commitment also expresses a preference (not commitment) for mass balance or area mass balance certified soy.[256]

The use of RTRS soy for domestic consumption is the result of retail agreements covering meat, eggs, and dairy, supply chain programs for specific pork, poultry, and dairy labels, and feed industry agreements. The members of the Dutch retailer association (CBL) committed to exclusively purchasing RTRS or equivalent soy for their products beginning in 2015.[257] The Dutch dairy production is fully covered by RTRS credit purchases.[258] 'Rondeel' eggs (0.3% of the egg market) have adopted stricter standards, requiring physical ProTerra soy in their feed.[259]

Dutch retailers are broadly represented in soy-related initiatives including the Consumer Goods Forum (where Ahold Delhaize acts as co-chair of the Soy Working Group and chair of the Soy Buyers Coalition), and the Cerrado Manifesto with all CBL members as signatories.[260]

At the end of 2018, the Dutch Soy Platform Initiative was established to bring together government, retailers, traders, the feed industry, trade initiatives, and NGOs (see section 2.6.1 for a more detailed description).

5.5.5 Replacement initiatives

Soy production in the Netherlands is still in the pilot phase. Agrifirm, a feed cooperation, started a program to encourage Dutch farmers to produce soy in 2013. In 2017 a total of 70 farmers cultivated soy on 400 hectares, achieving an average yield of 3 tonnes per hectare, and a total production volume of 1,200 tonnes. Some growers were able to reach yields up to 3.8 tonnes per hectare and the average protein content increased to 41.6% that year.[261] The Belgian soy-based food producer Alpro guaranteed purchasing of domestically produced soy.[262]

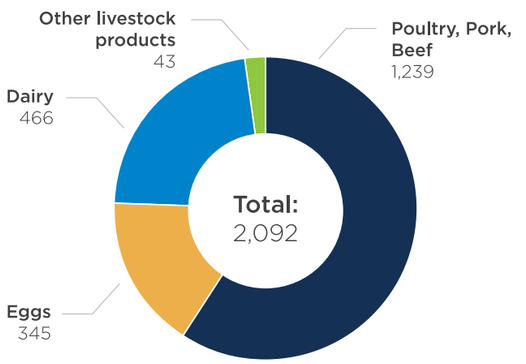
In 2018, the Dutch minister of Agriculture, Nature, and Food Quality published a visioning document to promote circular agriculture that encouraged the use of more regionally sourced feed materials.[263] The Raad voor Regionaal Veevoer (Council for Regional Animal Feed) reported in its final report in 2016 that lupine, alfalfa, peas, and grass clover could play an important role as alternative plant proteins. Insects could also potentially become a source of protein in animal feed.[264]

To stimulate the regional production of protein crops and grass-clover mixtures, the Dutch dairy sector has introduced a plan that calls for 65% of proteins used at dairy farms to come from the farm itself or within a radius of 20 km by 2025.[265]

5.5.6 Non-GM market preference

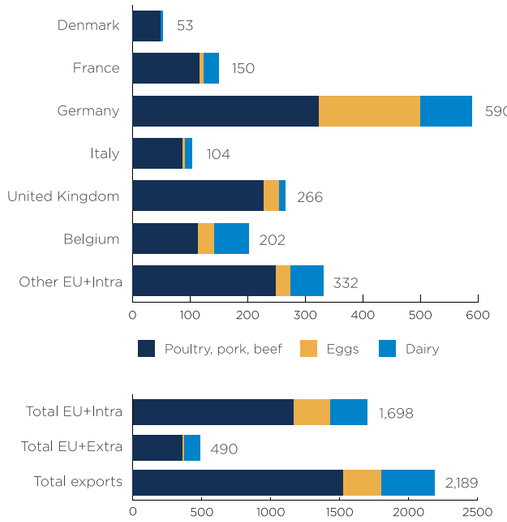
There is no strong market interest for non-GM fed livestock products in the Netherlands. The Netherlands is an important entry point for ProTerra soy, and more than 40 feed producers are certified under the criteria for GM-free production viae VLOG (see section 5.3.6).[266] Cheese producer Cono Kaasmakers (producer of the Beemster brand) announced in July 2018 that all its cheese would be guaranteed non-GM by 2020.[267] GM-free products developed in the Netherlands are often destined for the German market, as illustrated by the efforts of FrieslandCampina to fulfill German demand for VLOG-certified cheese.[268]

Figure 31 Embedded soy in livestock production in the Netherlands, 2017 (1,000 tonnes)



Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs, and livestock production.

Figure 32 Embedded soymeal exports Netherlands in 2017 (1,000 tonnes)



Note: Differences between total net exports and consumption of embedded soymeal due to rounding, losses, and stock changes.

Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs, and livestock production.

5.6 NORWAY

5.6.1 Overview

Import: In 2017, Norway imported a total of 495,000 million tonnes of soybeans, -meal, and -oil, with soymeal accounting for 54,000 tonnes. The largest share was imported from Brazil (303,000 tonnes), followed by Canada (160,000 tonnes). The crushing of 430,000 tonnes of the soybeans resulted in an additional 338,000 tonnes of soymeal. In addition, net imports of 281,600 tonnes of soy protein concentrate (SPC) for use in aquaculture production must be considered in Norway's soy use.

Domestic soy cultivation: The Norwegian climate is not suitable for soy cultivation.

Soymeal use in livestock production: After re-exports, a net volume of 610,000 tonnes of soymeal was available for the Norwegian livestock industry in 2017 (including the equivalent volume of soy protein concentrate used in aquaculture).

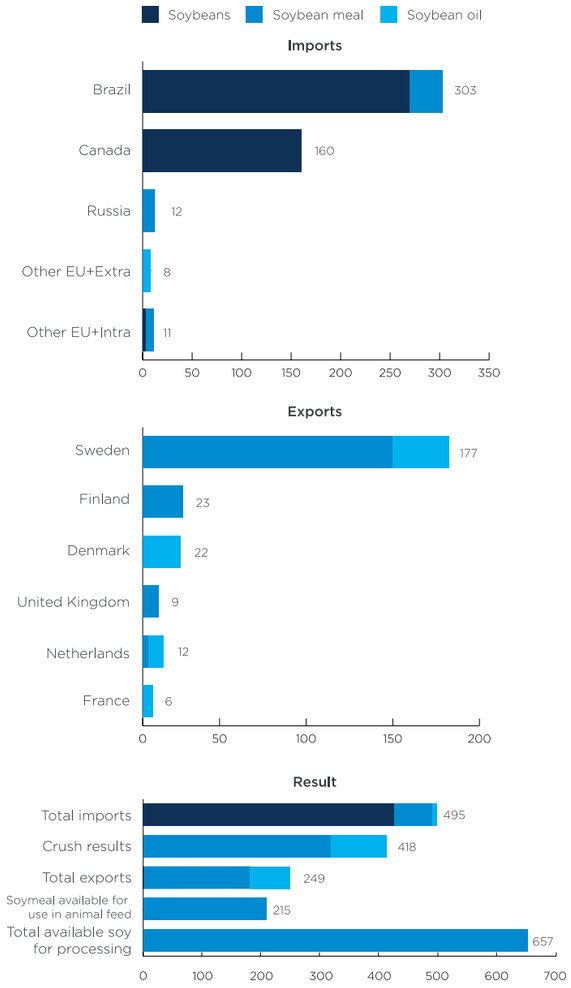
Domestic consumption: The Norwegian consumption of embedded soy in livestock products – both imported (11,000 tonnes) and produced locally – is estimated at 373,000 tonnes of embedded soymeal in 2017. Around 6,000 tonnes of soybean oil were consumed in biodiesel.

Export: An estimated 245,000 tonnes of embedded soymeal were exported in livestock products from Norway. The ADP countries accounted for an estimated 33% of these exports.

Compliance: In 2017, at least 80% of soy products used in Norway were FEFAC-compliant and deforestation-free.

5.6.2 Soy trade, use and consumption

Figure 33 Norwegian imports, exports, and net consumption of soy, 2017 (1,000 tonnes)



Note: aconversion factor 1.4 from SPC to soymeal. Net imports of SPC in 2017 totaled 281,626 tonnes.

Differences between net available soybeans, -meal, and -oil are due to losses and stock mutations.

Source: ITC Trade Map, "List of importing markets for a product exported/ imported by Norway", online: https://www.trademap.org/

See Figures 34 and 35 for embedded soymeal used for livestock production and in exported livestock products. In December 2018, the Norwegian Parliament voted to exclude biofuels produced from high

deforestation-risk feedstocks beginning in 2020. While palm oil is referred to as a key concern in this legislation, this should include soybean oil as well. In 2017, around 275,000 tonnes of Norwegian biodiesel were based on palm oil, accounting for 46% of all biofuels used in Norway. Soybean oil accounted for 1% of total biofuel sales, totaling approximately 6,000 tonnes.[269]

5.6.3 Share of compliant soy

All soy products used in animal feed in Norway (about 75% of which is used in aquaculture feed) must be GM-free certified, with ProTerra or RTRS as the most commonly used certifications.[270] The Norwegian industry committed to requiring ProTerra- or RTRS-certified soy for all soy sourced from Brazil or other tropical countries.[271] Based on these figures, an estimated 80% of soybeans, soymeal, SPC, and soybean oil used in Norway was FEFAC-SSG compliant and deforestation-free. At least 46,773 RTRS credits were purchased by Norwegian companies.[272] Imports of 279,627 tonnes of physical ProTerra soy were reported for Norway in 2018. This made it the second largest recipient of ProTerra soy.[273]

5.6.4 Initiatives for improved sustainability of soy imports

In 2015, five Norwegian feed companies initiated the Norwegian Roundtable on Responsible Soy with the aim to support and strengthen its members' work towards deforestation-free soy and to prevent further loss of HCV areas. They committed to immediately limit sourcing of soy originating from tropical forest countries and other HCV ecosystems to confirmed deforestation-free soy certified by a reputable standard (ProTerra or equivalent).[274] The companies signed the New York Declaration on Forests and support the Governors' Climate and Forest Task Force (GCF) efforts to facilitate jurisdiction-wide deforestation-free sourcing and investment in improving rural livelihoods.[m275]

In May 2016, the Norwegian parliament pledged to ensure deforestation-free supply chains through the government's public procurement policy. In its recommendation, the Parliament's Committee on Energy and the Environment requested that the government *"[...] impose requirements to ensure that public procurements do not contribute to deforestation of the rainforest"*. A government white paper on public procurement is expected to address the 2016 recommendation, however it has not been published as of February 2019 and it is not yet clear what conclusions the government will draw.[276]

m The GCF was initiated in 2008 by nine governors from Brazil, Indonesia, and the U.S., who signed MoUs on climate and forests cooperation. Since then, its membership has increased to 38 and its reach now includes jurisdictions from ten countries (Brazil, Colombia, Ecuador, Indonesia, Ivory Coast, Mexico, Nigeria, Peru, Spain, and the United States).

In 2017, Norwegian NGOs Framtiden and Rainforest Foundation Norway published a report on soy use in feed for aquaculture salmon. The authors recommended that the Norwegian fish industry decrease the use of soy in fish feed, and label products that have been fed with soy.[277] Due to concerns over reducing fish stocks, crop-based protein sources have increasingly replaced fishmeal in compound feeds (largely in the form of soy protein concentrate), and the aquaculture industry has become the main consumer of soy in Norway. However, after years of increasing soy use in fish feed, this share reportedly decreased by about 22% between 2015 and 2018.[278]

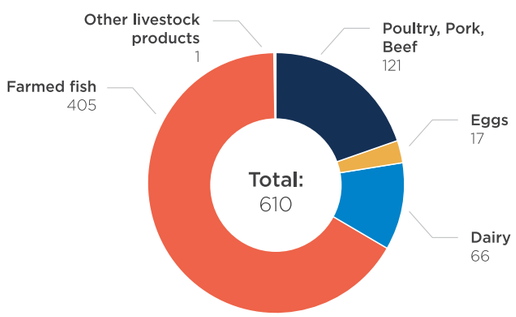
5.6.5 Replacement of soy imports

Supported by funds from the Research Council of Norway and industry partners, Norwegian researchers are studying options for innovative approaches to replacing fishmeal and soy in aquaculture feed. The 'trees to feed' concept is currently researching the possibility of converting trees into yeast to be used as a protein replacement that could offer improved quality.[279]

5.6.6 Non-GM market preference

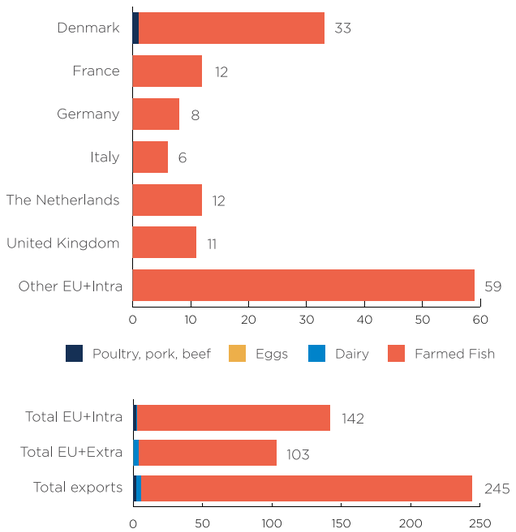
Norwegian regulation requires food and feed manufacturers to use only non-GM ingredients.[280]

Figure 34 Embedded soy in livestock production in Norway, 2017 (1,000 tonnes)



Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs, and livestock production.

Figure 35 Embedded soy flows Norway in 2017 (1,000 tonnes)



Note: Differences between total net exports and consumption of embedded soymeal due to rounding, losses, and stock changes.

Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs, and livestock production.

5.7 UNITED KINGDOM

5.7.1 Overview

Import: The UK imported a total of 2.9 million tonnes of soybeans, -meal, and -oil in 2017, with soymeal accounting for 1.9 million tonnes. The largest share of this volume originated from Argentina with 1.2 million tonnes. The crushing of 668,000 tonnes of the soybeans resulted in an additional 524,000 tonnes of soymeal.

Domestic soy cultivation: UK domestic soy cultivation resulted in a production of 6,000 tonnes in 2017.

Soymeal use in livestock production: After re-exports, a net volume of 2.4 million tonnes of soymeal was available for the UK livestock industry in 2017.

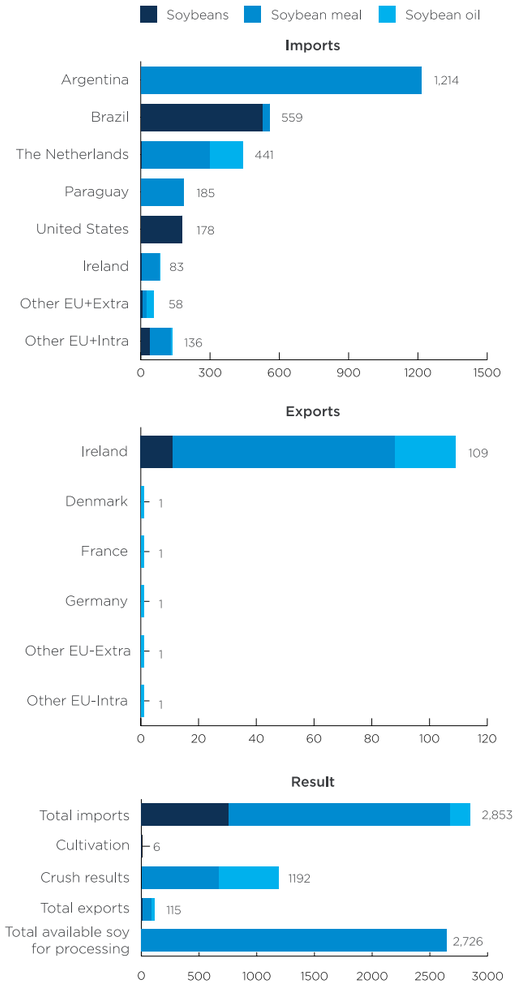
Domestic consumption: The UK consumption of embedded soy in livestock products – both imported (956,000 tonnes) and produced locally – is estimated at 2.9 million tonnes of embedded soymeal in 2017. No soybean oil was used as feedstock for UK biodiesel consumption.

Export: An estimated 449,000 tonnes of embedded soymeal were exported in livestock products from the UK. ADP countries accounted for 42% of embedded soy in exports.

Compliance: At least 37% of the soybeans, -meal, and -oil used in the UK was FEFAC-SSG compliant in 2017. An estimated minimum of 14% was certified under a deforestation-free scheme.

5.7.2 Soy trade, use, and consumption

Figure 36 UK imports, exports, and net consumption of soy, 2017 (1,000 tonnes)



Note: Differences between net available soybeans, -meal, and -oil are due to losses and stock mutations.

Eurostat (n.d.), "International trade in goods – detailed data", online: https://ec.europa.eu/eurostat/data/database

See Figures 37 and 38 for embedded soymeal used for livestock production and in exported livestock products. No soybean or palm oil was used as feedstock in UK biodiesel consumption in 2017.[281] Reportedly no soybean oil was used as feedstock in UK biodiesel production.[282]

5.7.3 Share of compliant soy

The UK Agricultural Industries Confederation (AIC) reported soymeal usage in compound feed of 2.2 million tonnes in 2017, of which 1.0 million tonnes were compliant with FEFAC SSG Guidelines.[283] Home mixing of feed, commonly practiced by pig farmers, may account for discrepancies in trade volumes.[284] Of the estimated 2.7 million tonnes of soybeans, -meal, and -oil used in the UK in 2017, at least 37% were FEFAC-SSG compliant. No detailed breakdown by scheme or program is available.

According to RTRS reporting, UK-based food sector companies purchased 225,984 RTRS credits in 2017.[285] The baseline report of the UK Roundtable on Sustainable Soy made estimates for the use of certified soy in the UK in 2017 based on confidential data submissions. The estimates for the shares of FEFAC-SSG compliant and RTRS soymeal were lower than the shares calculated for this report. ProTerra-certified soy made up an estimated 6% of soymeal used in the UK in 2017.[286] This suggests that an estimated 14% of the total soy used in the UK in 2017 was deforestation-free.

5.7.4 Initiatives for improved sustainability in soy imports

In 2017, major UK retailers, food producers, relevant industry associations from the agri-food sector, and the WWF convened the UK Roundtable on Sustainable Soy with support from the government. The signatories aim to address growing concerns about the link between soy production and tropical deforestation/conversion of native vegetation. The Roundtable aims to provide a pre-competitive space for companies and industry associations to jointly work towards a common goal and to jointly monitor and report on progress. The agreed common goal states that the UK Government will *"[...] support Roundtable signatories' commitment to soy that is legal and cultivated in a way that protects against conversion of forests and valuable native vegetation."* Signatories commit to publishing time-bound action plans by April 2019, and to make meaningful and demonstrable progress towards the goal by 2020.[287]

A survey of Roundtable members found that the proportion of soy sourced from legal and deforestation-free production as defined in the Roundtable goals varied by individual supply chain, with most members reporting ranges from 30 to 40%.[288]

The British NGO Forest Coalition consists of UK NGOs *"working on forests in the context of climate change, biodiversity, development and human rights"*. This includes activities around the soy supply chain. Among the diverse group of 14 members are the Environmental Investigation Agency (EIA), Global Canopy Programme (GCP), Rainforest Foundation UK, Global Witness, and WWF.[289] Individual member organizations have their own activities and areas of expertise but come together in the Coalition to focus on UK Government policies, funding, programs, and actions. Recent publications by members include research by WWF and the Royal Society for the Protection of Birds (RSPB) mapping the global forest impact of the UK's commodity needs. A briefing by GCP and the Carbon Disclosure Project (CDP) sets out recommendations for the private sector to tackle deforestation in soy supply chains.[290]

5.7.5 Replacement of soy imports

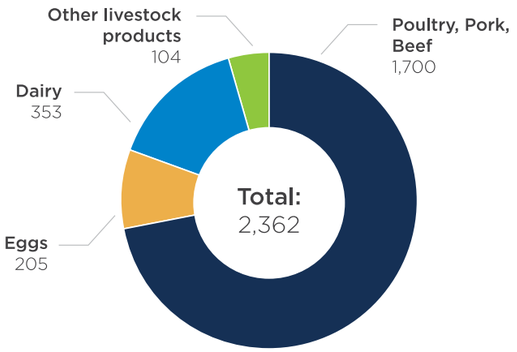
Soya UK had an average productivity of 2 to 2.5 tonnes of soy per hectare in 2018. With 3,000 hectares under production, Soya YK produced a total of 6,000 tonnes of GM-free soy, with plans to further expand in the coming years. The main customers for GM-free soy are animal feed producers (including horse feed) and food producers. The soy is certified and traceable under Exova BM TRADA Responsibly Sourced Soy.[291]

Lupin and peas are seen as promising protein alternatives to replace imported soy in feed.[292] Research into their potential is funded by the UK's innovation agency, industry partners, and other actors.[293] British fertilizer producer Yara reported cultivation of around 7,000 hectares of lupin, yielding about 17,500 tonnes.[294] The production of protein-rich pulses for animal feed in the UK has experienced a significant increase in recent years.[295]

5.7.6 Non-GM market preference

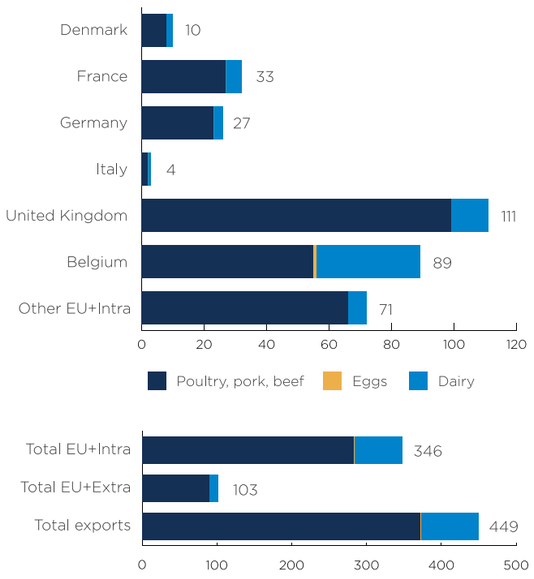
In 2016 Waitrose introduced a non-GM soy sourcing policy for its livestock products, largely relying on soy produced in Europe. The retailer has the intention of sourcing 100% of the soy in its supply chain from certified sources by 2021.[296] Waitrose does not specify its definition of 'certified sustainable sources' but does state that it includes organic, RTRS, and ProTerra certified soy.[297] In 2013 most other leading UK retailers backtracked on earlier commitments to non-GM animal feed in their branded livestock products, referring to difficulties in guaranteeing entirely GM-free soy.[298]

Figure 37 Embedded soy in livestock production in the UK, 2017 (1,000 tonnes)



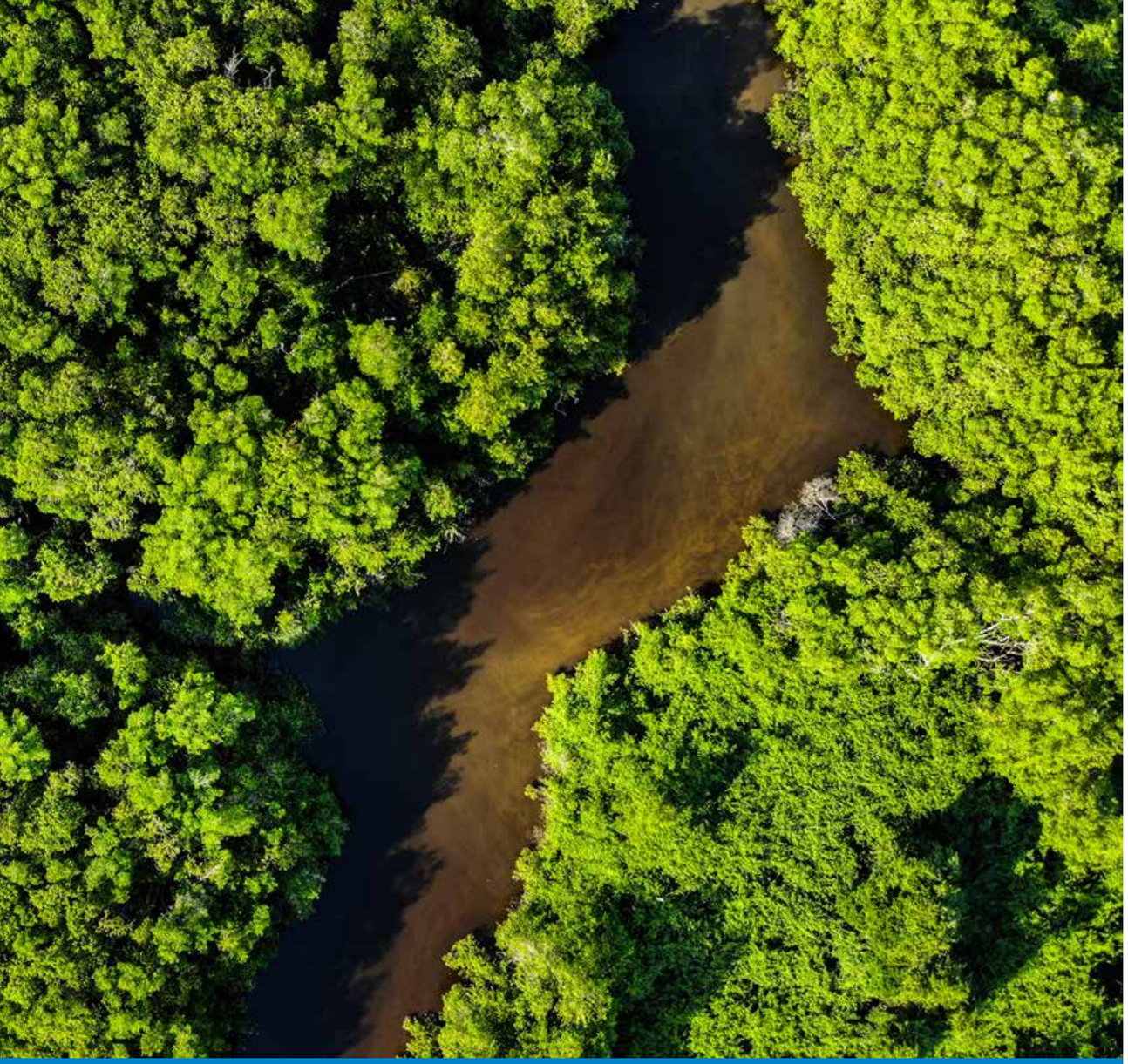
Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs, and livestock production.

Figure 38 Embedded soy flows United Kingdom in 2017 (1,000 tonnes)



Note: Differences between total net exports and consumption of embedded soymeal due to rounding and losses.

Profundo calculations based on trade statistics, estimated soy content in compound feedstuffs, and livestock production.



06 Conclusions

The results of this report clearly demonstrate that the uptake of responsible and deforestation-free soy is still low despite the efforts of the past years. By conservative estimates 7.6 million tons (22%) of all soy used in Europe in 2017 was compliant with the FEFAC Soy Sourcing Guidelines (SSGs), a baseline for responsible soy. Only 4.5 million tons (13%) were deforestation-free, as covered by RTRS, ISCC +, Proterra, Danube / Europe Soy, CRS / BFA and SFAP-Non Conversion, a subset of the standards compliant with the FEFAC SSGs. There is a large variation among European countries, from zero to 80 percent responsible, deforestation free soy.

Despite strong commitments and the founding of many industry working-groups, impact has been too marginal so far. The demand for sustainably produced soy must increase dramatically. New sustainable sourcing solutions need to be developed. Increased supply chain transparency is crucial and supportive policy to achieve this is needed.

Two jointly implemented pathways in the soy industry have the potential to accelerate change in production and demand:

1. increased purchasing of soy produced according to responsible and deforestation free criteria, initially via credits (preferably from a certain region) and if available physical product, and

2. development of regionally focused responsible supply chains.

Use of soy (for feed) in Europe must be covered by production standards that are at least compliant with the Fefac Soy Sourcing Guidelines. To achieve ambitions on deforestation free soy in Europe, IUCN NL & partners strongly advise the uptake of deforestation-free standards that offer high levels of assurance, aiming to catalyze the implementation of deforestation and conversion-free soy in producing countries and especially in so-called risk areas. End users such as retailers can easily cover their soy use with credits or request their suppliers do so. This report especially demonstrates the efficacy of credits that use regional certificates and area mass balance in ensuring real sustainable shifts and proper compensation for growers. For example, support to RTRS certified production in the Brazilian states of Maranhão and Piauí illustrates how certification in combination with on-the-ground support can drive sustainable development in a region.

Retailers and suppliers must also begin to develop relationships with specific sourcing regions to power the elevation of sustainability requirements on the ground. To ensure a link with your supply chain, carry out a footprinting exercise. Identify the traders your suppliers buy their soy from, the regions they source from, and push them to engage in multilateral processes to elevate production standards. Footprinting exercises carried out by four UK retailers in 2017 showed that 57% of the soy used for all eggs, meat, and dairy in the UK was sourced from just two traders. Europe has huge leverage – demanding sustainable soy has the power to affect entire industries.

Requiring that suppliers source from or support specific regions jumpstarts a cycle of regional improvement, changing both culture and production. Only buying credits or sourcing from regions where there are no problems is not the answer, we need to support continuous improvement and feed demand for sustainability across all production areas - from those just beginning to produce sustainably to those well on the path.

Solutions to improved regional sourcing are being developed. IDH is working on a new sourcing mechanism called Verified Sourcing Areas, which facilitates sourcing responsible soy at a competitive scale and price. By creating a direct link between sourcing areas and end buyers committed to sustainability, this model will allow the market to directly support local producers to achieve responsible production.

All actors — private sector, governments, and NGOs — need to step up our pace to reach 100% deforestation-free soy. In the next years we must work together to support farmers and governments in shifting production. The solutions are at hand – sustainable buying commitments, loans, technical assistance, and diplomacy all have the potential to fundamentally change the industry. The work to build environmentally and economically sustainable production systems must continue to grow – on the farm level, on a regional level, and last but not least at the market level in Europe.

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