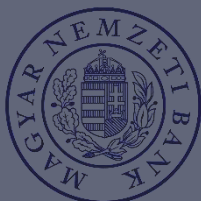




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International Scientific Conference  
on the Occasion of the Hungarian  
Science Festival

Sopron, 2021. november 4.  
4 November 2021, Sopron



**PANDÉMIA – FENNTARTHATÓ GAZDÁLKODÁS  
– KÖRNYEZETTUDATOSSÁG / PANDEMIC  
– SUSTAINABLE MANAGEMENT – ENVIRONMENTAL AWARENESS  
KONFERENCIAKÖTET / Conference Proceedings**

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## **Soy Supply and Organic Requirements for more Authenticity**

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### **Abstract**

The share of organic production is increasing constantly in Germany and other EU countries. The EU Commission expects a quota of 25 percent by 2030. This has positive effects on the environment, the climate, biodiversity and animal welfare. An increase in organic farming also has a direct impact on reducing or eliminating fertilisers, pesticides and antibiotics.

There are significant growth rates in egg production in particular, while other processing sectors have so far only been able to come up with small shares. The share of fattening poultry and pigs is still well below 2%, while the share of eggs is already 15% and rising.

The demand for protein is mainly covered by soy, but other protein sources such as legumes and especially sunflower and rapeseed have become very important.

Sustainability and CO<sub>2</sub> reduction are at the centre of public interest. Origin from European cultivation is therefore becoming extremely important. This significantly reduces the impact on the climate. The previous main suppliers in South America are waiting with smaller market shares. This is especially true for the organic sector, while conventional processing continues to rely on non-European origins for cost reasons.

*Keywords:* CO<sub>2</sub> reduction, sustainability, organic farming, climate protection

*JEL Codes:* D18, D20, E23, Q01, Q50

### **Research objective**

- Availability of soy in the EU.
- Organic farming for sustainability and CO<sub>2</sub>-Reduction.
- Cost-benefit analysis.

### **Hypotheses**

- The use of soy from European production leads to higher prices.
- Sustainability and CO<sub>2</sub> reduction have a positive impact on the environment.
- The food retail sector supports the initiative for more soy from the EU.

### **Structure and methodology**

The target group, implementation and evaluation of the specifications are oriented to the entire process chain. First and foremost is agricultural production, and here it is necessary to observe comprehensible specifications for cultivation, the use of fertilizers, pesticides and fungicides.

In organic farming, there are restrictions that must be adhered to and also require control by neutral certification bodies.

This means higher costs compared to conventional cultivation of protein carriers such as soybeans, sunflowers or legumes and requires a reorientation of production in terms of ecological standards.

In second place are processing, animal refinement, marketing, the food retail trade and finally the consumer as a buyer who is increasingly critical in his purchasing behavior.

As a consequence, this has an impact on the entire process chain. Currently, there is a high supply potential, especially of soy from South America at lower prices. However, share of organic from production is still very low.

In the evaluation, the added value is of importance, combined with the question of the extent to which higher prices in the interest of sustainability, conservation of environmental resources and CO<sub>2</sub> reduction offer market potential.

**Table 1: Methodology**

	<b>Requirements and contents</b>	<b>Objectives</b>
<b>Target group</b>	Agriculture, food trade, consumers	Cultivable land, availability, resources
<b>Basis</b>	Agriculture, foreign trade, processing, animal processing	Increasing self-sufficiency from EU cultivation at the expense of third-country origins
<b>Implementation</b>	Reorientation of cultivation, foreign trade and animal processing	Higher prices through sustainability?
<b>Evaluierung</b>	Implementation of the targets	Impact on production, added value

Source: Own research (2021)

### **Market overview oilseeds Germany**

The table below provides an overview of the soybean market in Germany. The share is currently just under 6%, but with an upward trend. Soybean and sunflower have the highest growth rates, while the share of rapeseed is shrinking. Figures on the share of organic cultivation are not available, but this is likely to be very low and in the low single digits compared to the total cultivation of oilseeds.

The same is true for animal finishing from organic products, but with one exception, and that is egg production. In 2019, the share from organic production was already 12% and in 2021 it is expected to be over 15%, with a further upward trend. Therefore, the evaluation of the egg market is of particular importance.

**Table 2: Global overview Soy**

<b>Soymarket Germany</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Share of food market, %.	5,20	5,30	5,70
Cultivation of oilseeds, ha	13.100	17.800	18.800
of this sunflower	3.200	3.500	5.600
Rapeseeds	5.100	7.100	4.000
Soybeans	4.100	5.900	7.800
<b>Organic production, t</b>			
<b>Pigs</b>	19.275	22.425	23.175
percentage share	< 1	< 1	< 1
<b>Beef</b>	27.600	29.500	31.150
percentage share	2	3	3
<b>Poultry</b>	15.199	17.978	19.001
percentage share	1	1	< 2
<b>Eggs , million pieces</b>	1.468	1.556	1.636
percentage share	11	11	12

Source: AMI, CD Consulting (2021)

### **Egg market Germany**

The production of eggs from organic production has been increasing for years. Despite significantly higher prices, there is a great demand, which is also related to greater animal welfare. This is because the production specifications and husbandry conditions go far beyond the conventional range, and in certain segments they even clearly exceed animal welfare standards, which explains the rising demand on the one hand. On the other hand, sustainability and the absence of pesticides play a major role, i.e. also health aspects.

**Table 3: Market overview animal Production**

<b>Germany</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Laying hen stock, million	46,8	48,0	49,2
of this organic	5,7	6,0	6,3
Egg production, million pieces	13.614	13.339	14.421
of this organic eggs	1.556	1.636	1.800
Imports of shell eggs, million pieces	6.640	6.460	6.100
<b>Consumption</b>			
pieces per capitack	234	235	239
of this organic eggs	26	27	30
<b>Fattening sector</b>			
Young chicken (Broiler) for fattening, 1,000 t	1.025	1.041	1.071
kg per capita	14,3	14,4	14,8
of this organic	0,5	0,8	1,0

Source: AMI, CD Consulting (2021)

Similar to beef and pork, organic production has not yet been able to establish itself with broiler chickens. This is mainly due to the significantly higher production costs and prices, which, in contrast to eggs, are an obstacle to the development. Consumer willingness to spend

more money on organically produced meat is low. This also applies to products with the claim for more animal welfare.

### **Initial situation**

Climate change creates great challenges for agriculture, as it is directly affected by rising average temperatures, changes in rainfall distribution, higher CO<sub>2</sub> concentrations in the air, as well as more frequent and more intense extreme weather.

### **Environmental and resources protection**

Agriculture must therefore be geared even more strongly than before towards resource efficiency and sustainability. This includes protecting natural resources such as soil, water and air, reducing negative impacts on the environment and climate, and increasing positive environmental impacts.

Therefore, in the future, arable farming must be geared even more strongly than before to resource efficiency and sustainability. This includes the protection of the natural resources soil, water and air, the reduction of negative impacts on the environment and climate, and the strengthening of positive environmental impacts (Klößner et al., BMEL).

Climate change poses major challenges for agriculture, as it is directly affected by rising average temperatures, changing precipitation distribution, higher CO<sub>2</sub> concentrations in the air, and more frequent and intense weather extremes (BMEL).

On the European level, the political orientation is significantly influenced by the so-called Green Deal as a new innovation and growth strategy of the EU Commission. The central elements of the Green Deal are the „Farm to Fork” strategy and the EU biodiversity strategy for 2030, which must be dovetailed with CAP measures. The Farm to Fork strategy aims to shape a food supply that is beneficial to consumers, producers, the climate and the environment, and to ensure food security. The share of organic production is to be increased to 30%.

The EU Commission is also planning import restrictions for soy, beef or palm oil if forest has been cleared for the cultivation of agricultural land. In the future, geodata from the production regions in combination with satellite images will ensure that the products do not come from areas that were still forested at the beginning of 2021.

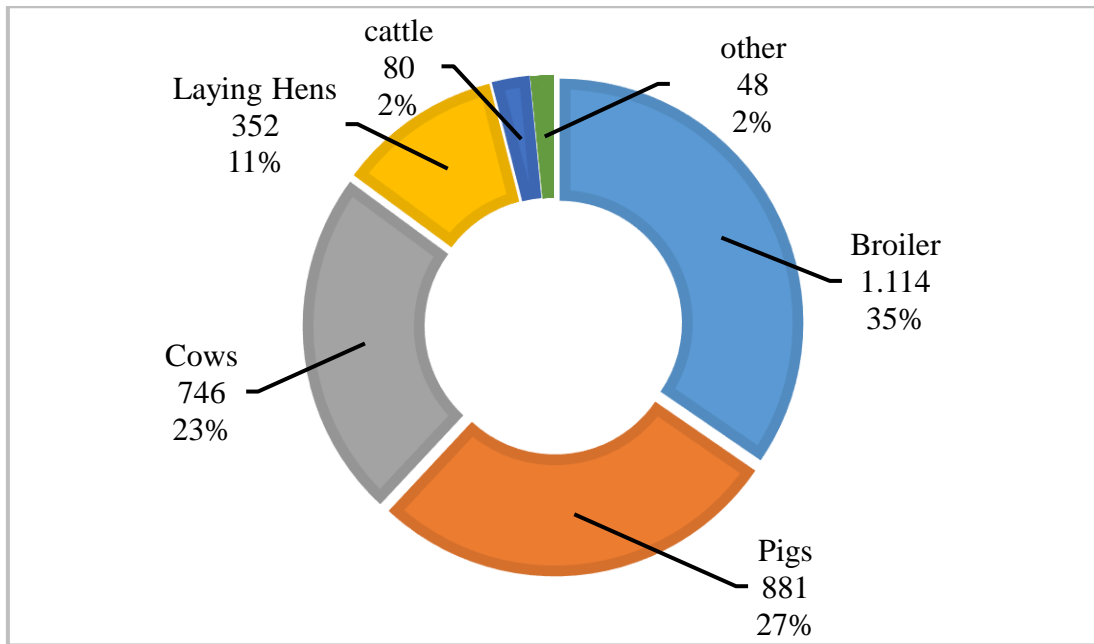
### **Environmental protection and resource conservation**

Demand for organic products in Germany is on the rise. The German organic market grew by 22 percent in 2020 to 14.99 billion euros. However, it can only be partially satisfied by German organic products. In 2019/20, for example, an estimated 15 percent of organic cereals, 28 percent of organic drinking milk and 27 percent of organic pork came from abroad. There is market potential here, particularly for small and medium-sized farms in Germany.

The strategy for the future defines the political framework for this. It opens options for action for domestic agriculture that can significantly improve its participation in the growth potential of the organic market. This applies to Germany as well as to Europe and the world (Klößner, BMEL).

The following graph on soybean cultivation is intended to show consumption in animal production. The poultry industry has the largest share. About 575 g of soy are consumed per chicken for rearing/fattening. And for eggs it is approx. 300 g must clarify here however that 1,5 kg weighs and the egg production is referred to a year, so that the actual consumption of protein components is relatively small in the comparison to pigs or cattle, which consume with 260 and/or scarcely 175 g by far less soy per kilogram however one must consider that pigs and cattle come up over a completely different live weight.

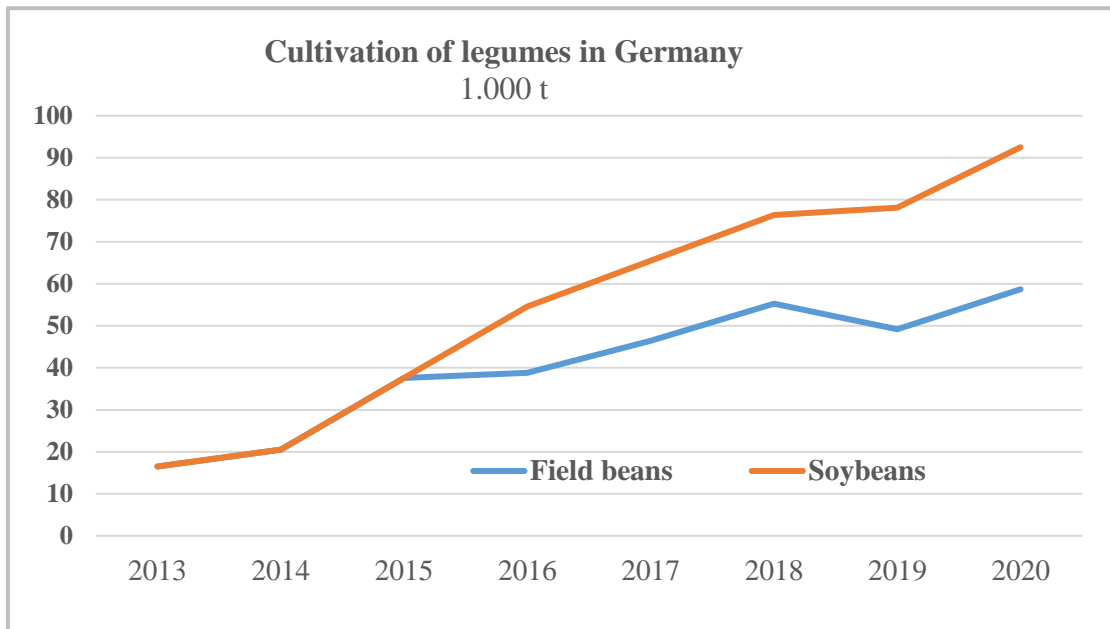
In terms of total soy consumption of 3.2 million metric tons, chickens are in first place with 1.1 metric tons. tons, chickens are in first place. This represents about 95% of the total demand followed by pigs with 27% cool 23% and laying hens 11%.



**Figure 1: Consumption animal processing 2018**  
Source: Deutsche Umwelthilfe e.V. (2020)

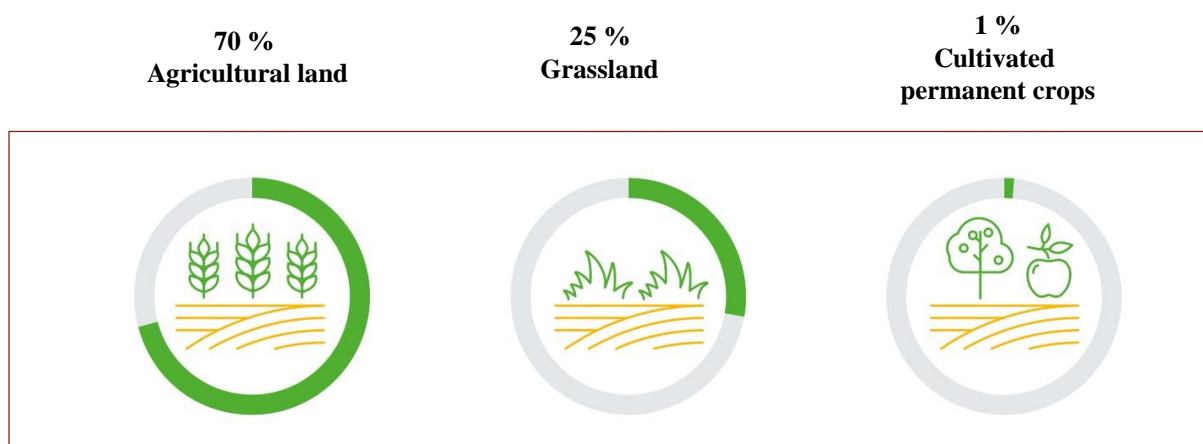
### Agricultural land by type of use in Germany

In recent years, the cultivation of legumes has increased steadily. This applies to both soybeans and field beans, which are primarily intended for animal processing. There are no figures on the share from organic cultivation. However, as it is difficult to obtain organic soy from third countries, this is likely to account for a relatively high proportion with an upward trend.



**Figure 2: Soybean cultivation**  
Source: Stat. Bundesamt, BMEL (2021)

In Germany, 11.7 million hectares are used for arable farming, i.e. 70 percent of the land used for agriculture. The remainder is divided between grassland (25 percent) and permanent crops. This makes arable farming a fundamental pillar of food security.



**Figure 3: Cultivation areas Germany**

Source: Stat. Bundesamt (2020)

### Production in Europe

Within the EU, Ukraine and Russia are the most important producers of soybeans, followed by European countries within the EU with just under 1 million tons of soy. The cultivation area in the Danube Delta region is particularly interesting. There is extraordinarily great potential here, especially in Romania.

The presentation of the relevant data shows the clear potential in the Eastern European countries that have corresponding agricultural areas within the Danube Delta.

Globally, soybean cultivation continues to increase and next year production is expected to reach nearly 400 million tons, mainly concentrated in South America. Soybean acreage for export to the EU from North and South America amounts to 12 million hectares, while cultivation within the EU is in the order of 5.3 million hectares.

The imports of soybean of the European Union are concentrated in Brazil with 39% and Argentina 28% and the United States 18%, totaling an average of 40 million tons in recent years.

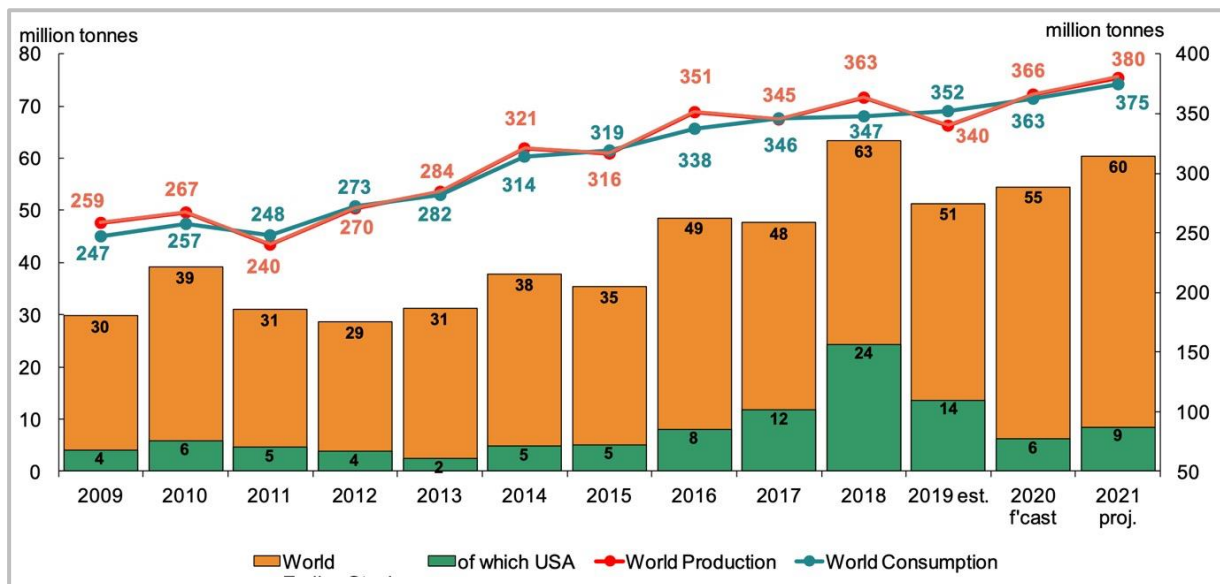
This is also illustrated by the following overview of the development of legume harvest volumes, which have increased significantly in recent years.

**Table 4: Soybean production in Europe**

Country	2019	2020	y/y change
<i>Ukraine</i>	1.590	1.446	-9,0%
<i>Russia (only European part)</i>	1.508	1.540	2,1%
<i>Italy</i>	273	290	6,1%
<i>Serbia</i>	229	240	4,6%
<i>Romania</i>	179	150	-16,1%
<i>France</i>	163	171	4,9%
<i>Croatia</i>	80	80	-
<i>Austria</i>	69	63	-1,7%
<i>Hungary</i>	60	58	-3,8%
<i>Germany</i>	28	33	14,2%

Source: Donau-Soja (2021)

The cultivation area of farms that are within the scope of the “Donau-Soja” initiative, mainly extend to Central and Eastern Europe. Italy, Germany, Poland and Ukraine are only partly in the Danube area.



**Figure 4: Weltweite Produktion von Soja**

Source: IGC, European Commission (2021)

### Global overview Soy

- Production of high-quality food.
- A secure income for the farmers.
- Protection of natural resources.
- Preserving agriculture.
- Further development and acceptance for climate protection and adaptation.

### Why Soy from the region and Europe?

Imports from Brazil, Argentina, the USA and other countries are associated with costs and high logistical effort. It is difficult to check for residues on site. We want sustainability, CO<sub>2</sub> reduction and no clearing of rainforests. The organic sector and the organic initiative also have special requirements, such as:

- no GMOs,
- no pesticides and fungicides according to the EU organic regulation,
- Transparency and traceability,
- Credible certificates of conformity,
- Origin exclusively from EU countries,
- Prioritisation of agricultural structures.

Soy from third countries are therefore not an alternative.

### The future of organic farming

GREEN DEAL – Producer to Consumer strategy and biodiversity strategy

At least 25% of agricultural land in the EU to be organic by 2030.

- In the area of eggs, the target is reached earlier.
- Thereby having a positive impact on the environment, climate, biodiversity, animal welfare, etc.
- An increase in organic farming has direct positive impacts on others the reduction or elimination of fertilizers, pesticides, antibiotics, etc.

## The key points of the EU regulations

### Crop production

- Conversion requirements for farms with crop production,
- preservation and enhancement of soil fertility through special cultivation and rotations of crops over several years,
- supplementary fertilizers and plant protection products only if they are included in special positive lists,
- basic use of organically propagated seed and planting material.

### Animal husbandry

- Conversion regulations for farms and animals of non-organic origin,
- livestock husbandry tied to specific areas,
- basic prohibition of tethering,
- feeding with organically produced feedstuffs,
- preservation of animal health, especially by promoting natural resistance,
- regular controls and proof of origin for organically produced meat.

### Imports from third countries

Another extensively regulated area is the implementing rules for third country imports (Regulation (EC) No. 1235/2008). They are intended to ensure that agricultural products and foodstuffs from countries that do not belong to the EU are only freely marketed as organic goods in the EU if conforming or equivalent regulations apply in the third countries, both regarding production regulations and about control measures.

The EU Commission has already examined and listed some third countries with their production regulations and control systems. By including these countries in Annex III of Regulation (EC) No. 1235/2008 (list of recognized third countries or third country list), the Commission has recognized that the production and control rules of certain categories of products in these countries are equivalent to the rules of EU organic legislation.

Only the listed products from these countries can be imported into the EU without a special marketing permit and marketed with a reference to organic farming. The prerequisite is that they have been inspected and certified by a recognized inspection body.

In addition, the EU Commission has recognized several inspection bodies operating in third countries, which are responsible for carrying out inspections and issuing certificates in third countries, regarding equivalence.

**Table 5: EU-Soy-Market**

Leading importers of Soy in the global market			
Mio. tons, 2019			
	beans		meal
<i>China</i>	89	EU	19
<i>EU</i>	15	Vietnam	5
Leading exporters of Soy			
		total	
<i>Brazil</i>	39%		
<i>Argentina</i>	28%	40 Mio. tons	
<i>US</i>	18%		
<i>other</i>	15%		

Source: Donau-Soja (2021)



The main exporters of soy are Brazil, Argentina and the USA. About 40 million tons are supplied to the European Union annually. According to the European Soy Monitor 2020, only 25% of imports are deforestation-free. Approximately 12 million ha of soybean acreage in North and South America is required for imports. 5.3 million ha were deforested for soy cultivation in the Amazon and Cerrado region (Brazil) from 2000–2016.

### Research objective

- *Availability of soy in the EU*  
The area under legumes is growing steadily, making the EU increasingly independent of imports from third countries. However, soy from South America is available at lower prices, making it less competitive for EU produce.
- *Organic farming for sustainability and CO<sub>2</sub> reduction*  
There is no alternative to organic farming. Regionality and compliance with organic farming standards are key.
- *Cost-benefit analysis*  
The costs of EU-grown soy are significantly higher. However, sustainability, reduction of CO<sub>2</sub> and environmental emissions for a better climate balance are in the first place.

### Hypotheses

- *The use of soy from European production leads to higher prices*  
Prices for organic products are at a much higher level than conventionally produced goods. Sustainability and reduction of CO<sub>2</sub> are already in focus. Therefore, there will be no higher prices.
- *Sustainability and CO<sub>2</sub> reduction have a positive impact on the environment*  
This is undoubtedly the case and is confirmed by many analyses.
- *The food retail sector supports the initiative for more soy from the EU*  
The food retail sector has been supporting such initiatives for years in the interest of sustainability and avoiding unnecessary waste of resources. Therefore, clear accents are set, which primarily concern organic farming but also the area of animal welfare.

### Conclusions

The cultivation of legumes, especially sunflowers and soybeans, has been increasing for years. The Danube Soya Initiative has taken a prominent position in this. Lower yields combined with higher production costs have so far stood in the way of development. Climate change, waste of resources and the desire for more regionality are leading to a rethink. This applies in particular to the field of organic farming. What many people are not aware of is that the origin of soy does not come from South America, the current main cultivation area, but from Europe.

Imports from third countries are no longer absolutely necessary to meet demand. Moreover, there are many alternatives to soy for animal protein supply, such as rapeseed, field beans or sunflowers. The recipes of the compound feed industry have changed. Nevertheless, soy remains the main ingredient. However, more is being used from EU production. In Germany, too, the areas under cultivation are increasing significantly and structures are being set up for processing.

CO<sub>2</sub> reduction is in the focus. By using regionally certified soya as feed, emissions can be reduced by more than 40%. A better climate balance is primarily achieved by avoiding the clearing of valuable forest areas in favour of agricultural land. In Brazil alone, millions of hectares of rainforest in the Amazon region are destroyed every year for soy cultivation. With the resources available in the EU, especially in the Danube Delta, this can be avoided in the future.

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