Economic impact assessment on the European GM authorisation "opt-out" proposal

1. Introduction

The purpose of this sectoral study on the economic impact of the European Commission's so-called Genetically Modified (hereafter GM) "opt-out" proposal[1] is to analyse the potential direct adverse effects, focussing on the feed and livestock sector, of four EU Members States[2] opting out from the EU GM authorisation. While most grains as well as many other feedstuffs[3] used for feed in the EU are not GM,[4] the vast majority of soybeans and its derived products are GM (approximately 90%, FEFAC, 2015), thereby playing an important role in the EU feed sector. Against this background, this study focuses on soybeans and soybean meal, respectively. The study begins with a description of the market for soybeans and soybean meal, illustrating the significant importance of soybean meal in the livestock sector, particularly in the EU and the four opting out countries (Chapters 2 and 3). On this basis, Chapter 4 describes the rapid increase in worldwide areas cultivated with GM soybeans and the decrease of non-GM soybean production. Chapter 5 examines the cost and practicality implications of sourcing non-GM soybeans and meal. Chapter 6 addresses the question of possible alternatives to GM soybean meal in the opting out countries.

The results and conclusions reflected in this study are the result of literature review on the relevant subjects, together with industry and expert opinions from three European sector organisations', which are practically involved in the sourcing, shipment, trading, processing and use of soybeans and their main derivatives.

2. The global market for soybeans and soybean meal

According to the United States Department of Agriculture (USDA), global soybean production on average of the last three marketing years (2012/13 to 2014/15) was at 290 mln t. Almost 244 mln t were processed in order to produce soybean meal and oil, while another 35 mln t were used for other purposes (mainly unprocessed food and feed). Given an average extraction rate in oil mills of 79%, worldwide soybean meal output thus amounted to 192 mln t. Domestic soybean production in

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[1] Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EC) No 1829/2003 as regards the possibility for the Member States to restrict or prohibit the use of genetically modified food and feed on their territory, COM(2015) 177 final.

[2] Germany, France, Poland and Hungary have been chosen as case study given their important livestock sector (39% of the value of EU livestock production), as well as decision to ban GM feed imports (i.e., Poland) or announcements favouring non-GM feed supplies (Germany, France and Hungary).

[3] E.g. rapeseed and sunflowers meal, palm kernel expellers, beet and citrus pulp pellets.

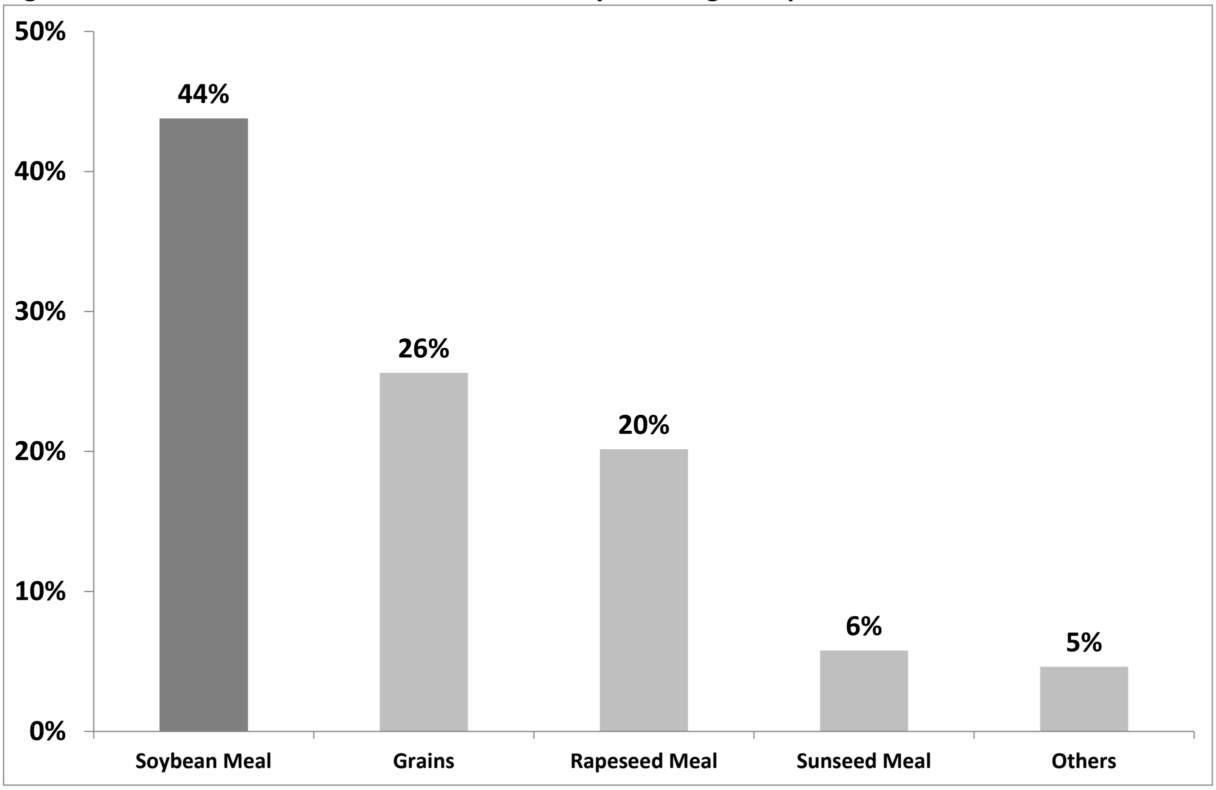
[4] According to the cereals balance sheet of the EU Commission – DG Agriculture, around 171 mln t of grains have been used for feed in the EU (including both compound feed production and farm feeding). Out of this total, a rough 1.3 mln t is GM maize from Spain (according to www.transgen.de, this is 123,000 ha (average of 2012-2014) multiplied with an average yield in the last three marketing years of 10.8 t/ha). On top, there was an average of 2.5 mln t (GTIS, 2015) of maize imported from the Americas, out of which a major share can be assumed to be GM. However, combined with the 1.3 mln t from Spain, total GM cereals used for feed made up just 3.8 mln t or 2.2% of the total cereals used for feed.

many countries does not cover domestic needs. At the same time, there are a few other countries with significant surpluses. Therefore, soybeans and soybean meal are traded globally while not necessarily processed in those countries where they are grown and processed. An example in this respect is China, which processes seven times more soybeans than it harvests domestically. Global soybean trade in the past three marketing years amounted to an average of 113 mln t, while that of soybean meal was 61 mln t (77 mln t in soybean equivalent). Overall trade in soybean equivalent was thus 190 mln t (USDA, 2015). The Americas by far make up for the largest share in both global soybean production and trade: around 86% of the global soybean production is located in the USA, Brazil, Argentina, Paraguay and Canada. Together, these countries account for 92% of global exports in soybeans and soybean meal combined (USDA, 2015).

3. Soybean meal in the EU opting out countries

On the average of the marketing years 2012/13 to 2014/15, the EU used 28.5 mln t of soybean meal for feed, i.e. 36.1 mln t in soybean equivalent. Out of this total, more than 35 mln t or around 97% were imported. The four potential opting out countries considered in this paper (i.e., France, Germany, Hungary and Poland) used 12 mln t of soybean equivalent (USDA, 2015 and Oil World, 2015). Given an average protein and lysine content in soybean meal of 46% and 2.8%, respectively, soybean meal provides 4.4 mln t of raw protein and 265,000 t of lysine to the livestock sector in the above mentioned four countries. This, in turn, means that soybean meal represents 32% of the total protein and even 44% of the total lysine that is used by the livestock sector in the opting out countries. In this respect, Figure 1 clearly shows the essential importance of soybean meal for the livestock sector.

Figure 1: Share of individual feedstuffs* in total lysine usage in opt out countries



Source: Strategie Grains, Oil World, Fachstufe Landwirt, GTIS, own calculations.

* The following types of feedstuffs have been considered: all major cereals (wheat, barley, maize), soybean meal, rapeseed meal, sunflower seed meal, maize and wheat by-products, beet pellets and citrus pulp pellets, palm kernel expellers, feed beans and peas. Roughages are not taken into consideration due to a lack of available data.

In a three-year average compound feed production in the opting out countries of 55.8 mln t, soybean meal has a share of 22%, which is the second place after cereals (49%) (FEFAC, 2014). Indeed, soybean meal is the most cost effective and nutritionally balanced source of protein available and, therefore, the preferred protein source in animal nutrition in modern livestock farming systems, both in the four potential opting out countries and in the EU. This is due to soybean meal's unique combination of a high concentration of proteins (up to 48%), high content in essential amino acids (in particular lysine), high digestibility[5] and low fibre content (Miller, 2002). No other vegetable protein combines the same nutritional characteristics. Offsetting lower digestible protein content by feeding higher amounts of alternative feedstuffs is not possible without impairing livestock performance and therefore the economic viability of livestock holdings, since animal feed intake per day is limited and modern animal nutrition is based on the "least-cost" formulation of feedstuffs. In particular, using other vegetable protein sources would require balancing the diet with synthetic amino acids, most of them being produced with GM micro-organisms (100% for lysine). Animal protein sources with a similar protein content are either banned in the EU for feeding purposes[6], available in too small quantities or are too highly priced (as in the in the case of fishmeal, due to limited global availability).

However, there are significant differences in inclusion rates among animal species. Indeed, different digestive systems require different protein concentrations in the diet. Soybean meal is by far the protein source of choice in poultry nutrition, which requires typically the highest digestible protein concentration among intensive livestock species. The share of soybean meal in laying hen and broiler feed rations often reaches 30%. Pigs, in contrast, do not require the same protein concentration as poultry, in particular at the fattening stage. This means that, from a feed optimisation perspective, partial or even complete substitution of soybean meal by other vegetable protein sources is significantly less feasible in the poultry sector than in the pig sector.

4. The market for GM and non-GM soybeans

Over the past ten years, worldwide cultivation of GM crops has grown significantly (see Figure 2). The GM soybean area grew from virtually zero in the mid-1990s to 90 mln ha in 2014 (James, 2014). This reflects the trend in the key producing and exporting countries in the Americas. According to the International Service for the Acquisition of Agri-Biotech Applications (ISAAA) and www.transgen.de, the share of GM soybean area in the main global soybean producing countries in 2014 was 94%, 93% and 100% respectively in the USA, Brazil and Argentina. The main reason for this rapid growth in GM crop plantings has been their popularity among farmers using the technology and especially the positive impact on profitability when compared to their conventional alternatives. Gross margins for GM soybeans are typically higher compared to non-GM soybeans, as GM varieties are generally cheaper to grow, some GM traits deliver higher yields than the conventional alternative and, in South America, the technology has helped many soybean growers increase their production of second crop soybeans (planted after wheat in the same season) (Brookes and Barfoot, 2015).

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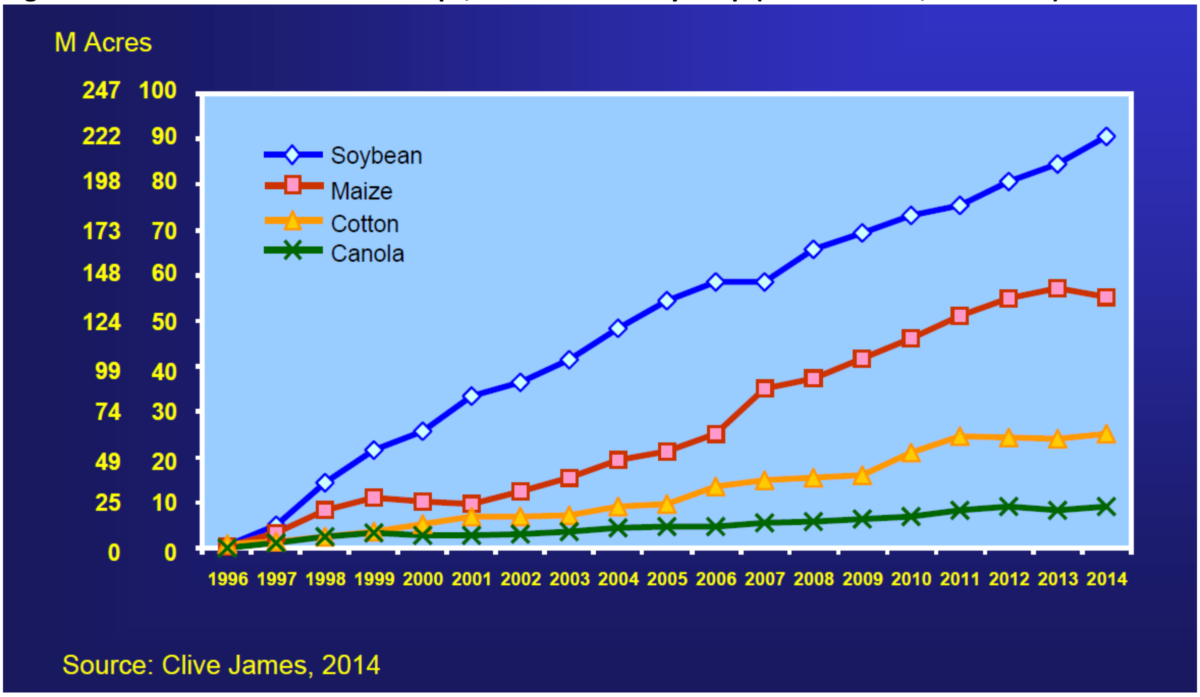
[5] The digestibility of a feed determines the amount that is actually absorbed by an animal and therefore the availability of nutrients for growth, reproduction, etc.

[6] With the exception of non-ruminant processed animal protein in fish feed.

Figure 2: Global Area of Biotech Crops, 1996 to 2014: By Crop (mln hectares, mln acres)



The popularity of GM technology in global soybean production is summarised in Table 1, together with its implications for global trade and availability of non-GM soybeans and derivatives. This suggests that only 12 mln t of non-GM soybeans were harvested in the five major soybean producing countries in the Americas on average of the marketing years 2012/13 to 2014/15 (USDA, 2015 and www.transgen.de). The main soybean producing countries that do not allow the planting of GM soybeans are China (12.5 mln t), India (10.5 mln t), Ukraine[7] (1.8 mln t) and the EU (1.3 mln t) (USDA, 2015). However, China and the EU are net importers of soybeans and do not export non-GM soybeans or soybean meal. In addition, a substantial part of the "statistically" available supplies of non-GM soybeans referred to in Table 1 is unlikely to be suitable for use in the EU market as "certified non-GM" because of poor quality and commingling issues (i.e., the likelihood of trace of GM material being found in supplies of non-GM soybeans and meal despite costly strict segregation and identity preservation (IP) measures in place from the source of supply to the end user). Therefore, estimations suggest that the current global availability of commercially usable non-GM soybeans and meal for animal feeding purposes is about 9 mln t (see Table 1).

[7] Officially Ukraine does not permit the planting of GM soybeans. However, a significant part of the Ukraine crop is estimated to be planted with varieties containing a GM herbicide tolerant trait.

Table 1: Average supply of non-GM soybeans and soybean meal (average of 2012/13 - 2014/15)

	Net trade position in soybean equivalent (mln t)	Soybean Production			Maximum non-GM export potential (in soybean equivalent)
Country	Net trade position	Total (in mln t)	Share of GM (in %)	Volume of non GM (in mln t)	Volume (in mln t)
Total		290.4			9.1
USA	41.8	94.1	94	5.6	0.0
Brazil	56.4	87.7	93	6.0	6.0
Argentina	36.0	54.5	100	0.0	0.0
Paraguay	6.3	8.3	95	0.4	0.0
Uruguay	3.0	3.5	100	0.0	0.0
Canada	1.4	5.5	96	0.2	0.0
Ukraine	1.3	3.0	40	1.8	1.0
China	-54.5	12.5	0	12.5	0.0
India	5.5	10.5	0	10.5	2.1
Bolivia	2.0	2.6	83	0.4	0.0
Total EU	-34.3	1.3	0	1.3	0.0

Source: USDA, www.transgen.de, own calculations.

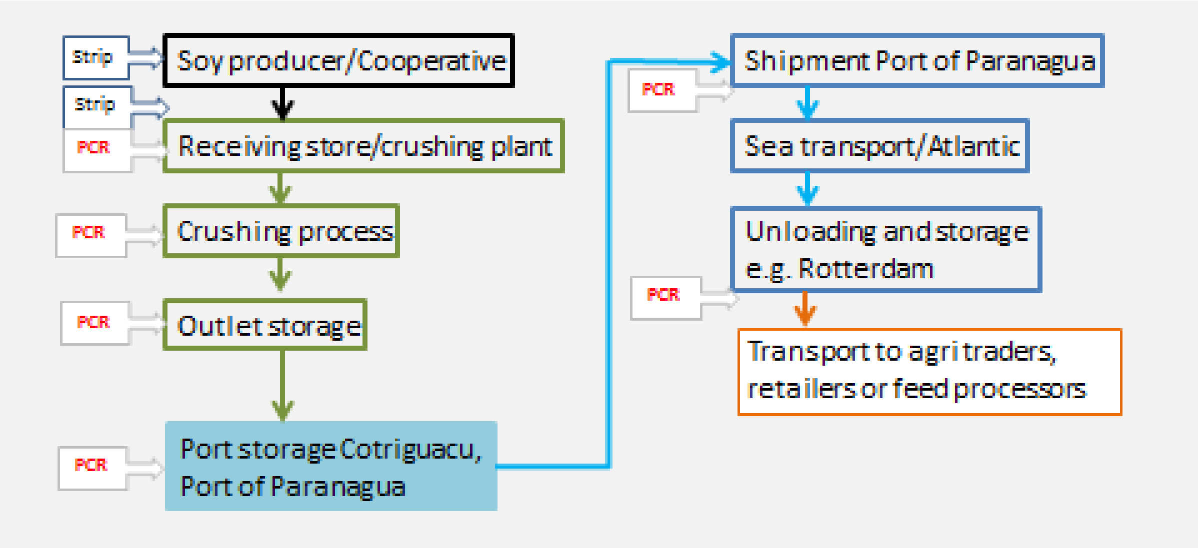
5. *Costs implications of sourcing non-GM soybeans and soybean meal*

For many years, the EU feed industry has proactively responded to the EU political request to ensure consumer choice by importing non-GM soybeans and soybean meal and supplying them as a niche product to specific domestic market segments at high premiums over GM soybeans. EU imports of non-GM soybeans and soybean meal for feed were at around 2-3 mln t and thus making up for quite a substantial part of what was theoretically available in the exporting countries. However, the aggregated EU demand for livestock products from farm animals fed with non-GM feed has not increased, with the overall demand for non-GM soybean meal having remained stable for a number of years and in fact possibly having recently slightly decreased (as illustrated by the recent decision of important retailers to no longer require non-GM feed ingredients in some of their own label products) (The Poultry Site, 2013). Overall demand for certified non-GM soybean has largely remained at 3-4 mln t (imports plus around 1 mln t domestically produced soybeans) or about 10% of the total EU demand for soybean meal (FEFAC, 2015). [8]

A major cost item of sourcing non-GM soybeans is ensuring segregation along the whole supply chain (i.e., from field/seeding to end customer). As illustrated in Figure 3, potential commingling is checked at various stages along the supply chain via so-called strip tests and Polymerase Chain Reaction (PCR) tests. PCR tests measure the percentage of commingling of non-GM with GM events. During production, collection, transportation, storage and processing of GM soybeans, adventitious mixing is difficult to prevent and cleaning of the respective capacities between charges is complex and time consuming and, therefore, extremely costly. If, at any point, commingling takes place, all previous efforts are rendered useless and the soybeans or meal cannot be sold as non-GM.

[8] 800,000 t of non-GM soybeans are used for food purpose in the EU and are almost exclusively coming from the USA (USDA – private communication).

Figure 3: Supply chain and test stages for ensuring non-GM contamination



Source: adapted from R. Dullweber, 2015

Additionally, contracting with the farmer and exporting soybeans and soybean meal to Europe are at least four or five months apart, during which price conditions can change (due to changes in demand). More crucially, farmers need to know the price premium they will be offered for growing non-GM soybeans prior to sowing and this needs to be sufficiently high to encourage them to switch away from planting the otherwise more profitable GM soybeans. This also means a risk premium has to be paid to the supplier in addition to the higher price offered to farmers. From a trader/crusher perspective, it has to be kept in mind that the price of non-GM cannot be guaranteed also because weather conditions, as well as seasonality of supplies, have an effect on yields, leading to better or worse results than average. Given the modest size of the overall non-GM soybean market, this could lead to significant price swings.

The premium paid by EU importers of non-GM IP soybean meal is not necessarily linked to soybean meal market prices and is highly volatile. Over the last 15 years, it has increased substantially (Tillie et al., 2012). The average premium seen so far in 2015 is at around EUR 80/t, but there have even been peaks of up to EUR 200/t in the spring of 2014. The rapid increase of GM crops production at global level will make the industrial management of non-GM IP compound feed even more complex and costly. In recent years, testing has been adding an extra USD 300 to USD 1,500 (the former for a simple test and the latter for a specific GM test). Altogether, the need for dedicated silos, rinsing, cleaning, analysis and administrative costs for compound feed producers add another EUR 30/t to the above mentioned trade-related non-GM premium (FEFAC as cited in Tillie et al., 2012). The foreseeable increase in demand for non-GM soybean meal under a possible opting out scenario would lead to even higher premia and costs.

A considerable high farm level price premium would probably be needed to be paid to offset the direct farm benefit of using GM soybeans in South America, and therefore to encourage farmers in the region to switch back from producing GM soybeans to growing non-GM soybeans (based on Brookes and Barfoot, 2015). Cleary, the increased GM share of total production in recent years, especially in Brazil, suggests that current and recent non-GM price premia have been insufficient to maintain supplies of non-GM soybeans and would have to rise if additional supplies are to be secured. In this context, it is clear that, due to the cost and logistical reasons detailed above, it is highly unlikely that the EU and the four opting out countries would increase imports of non-GM soybean or soybean meal beyond the current volumes in the short term and in the medium to long term, significantly higher prices would have to be paid for non-GM soybeans.

6. *Possible alternative protein feedstuffs*

The analysis in the previous sections suggests that there are currently not enough non-GM soybeans available in the world to replace GM soybean and meal use in the four potentially opting out countries. Moreover, even if farmers in the main soybean growing countries were persuaded to grow more non-GM soybeans (by offering significant price premia compared to GM soybean prices) so that supplies were sufficient, practicability and cost implications would remain significant.

In this light, it is pertinent to examine whether there are any alternative forms of feed that could replace soybeans and soybean meal and that are:

- Suitable from a technical and nutritional perspective; and
- Availability in sufficient volumes and at competitive price.

As detailed In Chapter 3, soybean meal is the preferred option in poultry production, hence rendering all alternatives less desirable, as illustrated by the impacts of a temporary ban on the imports of soybeans and soymeal that occurred in Turkey in 2009-10, as illustrated by the impacts of a temporary ban on the imports of soybeans and soymeal that occurred in Turkey in 2009-10 when the Turkish government introduced a new Bio-safety Law. This resulted in a temporary ban on imports of soybeans and soymeal until GM soybean and meal were formally authorised for importation and use in the feed sector. This temporary ban badly affected the poultry and egg sectors which had to firstly draw on existing stocks of raw materials and then, as a last resort, switches to alternative ingredients. The volume of production affected at that time was approximately equal to about 3 months production of poultry meat and eggs. The main alternative feed ingredients used were sunflower meal and wheat bran (plus enzymes). Due to the crucial importance of soy derivatives to productivity and performance in the poultry and egg sectors, this switch to alternative ingredients resulted in poorer feed conversion rates (ie, lower efficiency and higher costs from slower rates of growth) and a need to increase the amount of feed used in order to deliver the same performance as a soy ingredient based feed. In addition, poultry flocks experienced higher incidence of diarrhea and bird mortality, which resulted in production losses and poorer meat quality equal to a loss of production of about 2%. Therefore the switch in feed ingredients during late 2009/early 2010 cost the Turkish poultry and egg sectors approximately $103 million in terms of additional feed required and loss of production (Brookes G 2012).

France, Germany, Hungary and Poland currently use 10.8 mln t GM soybean equivalent.[9] In the event that these four countries opted out, 16.2 mln t of rapeseed meal (based on ileum digestible lysine) or an additional 27.9 mln t of non-GM rapeseed would be required. This additional quantity of rapeseed is not available on the world market. Based on average yields, an extra 8.5 mln ha to grow rapeseed would be required in the EU, which equals to an increase of more than 100% from the 6.5 mln ha cultivated on average of the past three marketing years. If imported from e.g. Ukraine and Australia, for example, the rapeseed area in these countries would need to increase by 12.0 mln ha (plus 1,500%) and 17.9 mln ha (plus 750%) respectively based on their average yields. As per the same calculation, an additional 33.4 mln t of sunflower seed (3.9 times the normal EU crop) or 18.0 mln t of peas (around 18 times the EU crop) would be needed. The required extra amount of soybeans grown in the EU would be at around 15.0 mln t (twelve times the usual EU crop) since the protein content is on average around 25% lower than in imported soybeans.

[9] As mentioned in the previous section, total non-GM soybean equivalent use in the whole EU is 3-4 mln t or 10% of total soybean equivalent use, consisting of both imports and domestically produced soybeans. For simplicity reasons, this 10% share is also applied to the opting out countries, which results in a total GM soybean equivalent use of 10.8 mln t.

Even if the additional production of either 27.9 mln t of rapeseed or 33.4 mln t of sunflower seed (or any combination thereof) was possible, the EU does not possess the necessary crushing capacity to transform the oilseeds into oils and meals. Even if it was possible to build the necessary additional crushing capacity in the short term in the potential opting out countries or in the EU, such additional crush volume would produce considerable amounts of additional rapeseed oil (>11.5 mln t), sunflower oil (>14.5 mln t) or any combination thereof. The vegetable oil market in the EU is well balanced. Beyond the 775.000 t of oil to replace the currently produced soybean oil in the opting out countries (see below), there is no demand for further substantial volumes of vegetable oils, neither within nor outside the EU at prices that could sustain a workable crush margin. With such volume of additional vegetable oil production, prices in the potentially opting out countries and in the EU could collapse and render the (heavy) capital investments in additional crush capacity totally uneconomical.

In this light, it is very unlikely that the above mentioned alternative crop volumes can be cultivated. Moreover, in terms of the crop rotation role that these break crops are mainly used for, both rapeseed and sunflower cultivation levels have already reached their maximum in several major growing areas of the EU. In addition, any extension in the areas planted to these crops is likely to require planting in areas less suitable climatically for growing these crops.

Lastly, if the area planted to oilseed and protein crops increased, the production of other crops will likely fall. For example, if a required 8.5 mln ha of additional rapeseed plantings resulted in an equivalent fall in the area planted to wheat, wheat production would drop by roughly 45 mln t or almost one third of average production levels. As a result, the EU could become a net importer instead of being a long standing and reliable export source of quality wheat. Alternatively, if imported GM soybeans and soybean meal in France, Germany, Hungary and Poland could be replaced by extra soybeans grown in the EU, this would require an additional 5.1 mln ha. If this extra soybean area resulted in reduced maize cultivation, the European maize crop would be reduced by at least 25 mln t. To offset this deficit more maize would have to be imported, with a major part of that potentially being GM maize, given that the majority of world traded maize comes from countries where GM maize is widely grown (e.g., the USA and Argentina) and available supplies from non-GM sources (e.g., Ukraine) are limited.

7. Overall assessment

The previous chapters have shown that there are few, if any, practical or economically viable alternatives to GM soybean and/or soybean meal imports in the four potentially opting out countries. Availability of non-GM soybeans is currently very limited and, in light of the high risks and costs of GM and non-GM segregation, coupled with the need to pay significantly higher price premia for non-GM supplies if South American farmers are to be encouraged to grow more non-GM soybeans, it is highly unlikely that the whole supply chain (including farmers) switches back to non-GM.

The foreseeable impacts on the potential selected opting out countries concern both the short and long term. They stand to affect operators along the supply chain, regardless of their location in exporting countries or in the EU, as well as entire industry sectors and, of course, consumers.

In the short term, and as explained in Chapter 5, the need to maintain two strictly separated supply chains will require increased efforts and costs in exporting countries and in the EU opting out jurisdictions. In addition, there are specific challenges from a logistic viewpoint that cannot be ignored. In this regard, it must be kept in mind that, unless non-GM soybeans are shipped directly to a crushing plant, they are typically stored in dedicated silos that need to be thoroughly cleaned. The trucks in which such soybeans are transported also have to be exhaustively cleaned. At the crushing plant, non-GM soybeans are again stored in dedicated silos. In turn, the crushing plant has to be cleaned, which inevitably adds costs and time to the process. Moreover, the risk of commingling is so high for the first non-GM soybeans that are crushed, that they are normally sold as GM. It is only after several hours (or an entire day), that those soybeans may be safely used as non-GM. Nonetheless, even if cleaning and separation protocols are rigorously observed, the risk of commingling cannot always be entirely overcome.

Segregation and associated costs will eventually pose a tremendous financial burden on the opting out countries' livestock sector. Using a conservative approach (i.e., based on the average 2015 non-GM soybean meal premium of EUR 80/t and adding the EUR 30/t for extra measures), compound feed costs for the EU livestock industry would rise by around 10% or EUR 1.2 bln when France, Germany, Hungary and Poland opt out. Should all EU countries opt out, the extra costs would increase by EUR 2.8 bin for the EU livestock sector. In specific sectors which strongly rely on soybean meal feeding, such as poultry production, feed costs could further increase by 15%.

National GM bans for feed use would likely lead to a loss of competitiveness to the intensive livestock sector in these countries. If GM soybean meal had to be replaced by non-GM soybean meal, the entire sector could potentially foreclose or relocate (whether to EU non-opting out Member States or third countries). In the latter case, and to the extent that costs associated with the high premia for non-GM soybean meal are not passed onto consumers in the form of higher prices for livestock products (typically these markets are very price-sensitive and there is very limited consumer preference for farm animals fed with non-GM feed), the livestock sector in the relevant countries could eventually experience a significant loss of competitiveness both in its domestic markets and for the profitable export markets, the latter of which have become key to many livestock producers in the potentially opting out countries.[10] In Hungary alone, 40% of the national poultry production is destined to export markets. In Germany, the share of exports in total livestock products is constantly rising. France is the leading poultry exporter to Saudi Arabia. And last but not least, Poland has doubled its livestock production over the past ten years, with poultry products destined for export taking the major share.

Consequences for the European oilseed crushing industry would be detrimental. The soybean crushing industry may not be able to recover through the selling of oils and meals, the extra-cost paid for non-GM soybean supplies. Indeed, if the export oriented livestock industry is under strong competitive pressure, there will be limited ability to absorb higher prices for compound feed. The food industry will certainly not want to pay higher prices for non-GM soybean oil as it is expected that other oils, traditionally non-GM, are available on the EU market at lower cost. All in all, soybeans crush risks becoming quickly economically non-viable for the three plants -with an annual processing capacity of 3.9 mln t- that operate in the four opting out countries.

Should EU compound feed and livestock production facilities relocate within the EU (away from opting out countries) or to third countries, this would result in a decrease in rapeseed meal and sunflower seeds meal demand in the opting out countries and possibly in the EU, which, in turn, would lead to a reduction of the EU's crushing capacity. This reduction looks poised to result in lower income and employment generation in the livestock sector; while EU produced oilseeds will be crushed outside the EU (thereby losing the added value derived from crushing in the EU).

[10] In this context, it shall be noted that EU Commissioner Phil Hogan highlighted at the Special EU Farm Council on 7 September that increased exports of EU livestock products are the most effective way forward to address the current EU market crisis. Any raise in feed costs as a result of a Member State decision to ban GM feed imports would effectively "condemn" the country's livestock sector efforts to become competitive at global level.

Additionally, the relocation of the livestock sector would likely result in opting out countries increasing livestock product imports (clearly, from non-opting out countries, i.e., which continue to employ GM feed for food-producing animal production). In addition, there would likely be a negative impact on investment, income generation and employment in rural areas, as the added value derived from livestock production tends to be significantly higher than arises from exporting unprocessed grains and oilseeds.

EU imports of non-GM soybeans for food processing purposes (tofu, soya milk, etc.) are unlikely to be substantially affected by any opt out, inasmuch as these products already mostly use certified non-GM sources of supply and follow strict and costly IP systems (including directly loading into bags or containers at the harvest field), often require specific varieties and are traded at significantly higher price premia than those referred to earlier in this paper. The food processing sector is much more able to manage and use certified non-GM soybean supplies than the feed and livestock sectors, inasmuch as such ingredients typically account for very small shares of total ingredient use and cost. Similarly, they normally trade in price-insensitive markets. This means the food processing sector is much more able to absorb the additional costs of using certified non-GM supplies than the livestock production sector, where volumes required and the contribution towards total costs are much higher for products that typically trade in highly price-sensitive markets.

As for the impact on oils used in the food sector, it is noted that, as most soybean oil currently used in the opting out countries derives from GM soybeans, refining units in such countries would likely no longer take the risk of importing crude soybean oil. As happened in Turkey, the food sector will likely replace consumption volumes of refined soybean oil with other domestic conventional oils such as rapeseed oil or sunflower oil and deliver this, after refining, to domestic customers. This would require the replacement of 775,000 t of soybean oil and, if replaced by additional volumes of rapeseed or sunflower oil, would require an additional 1.8 mln t of these oilseeds to be crushed. If demand for these alternative oils rose by this amount, this could result in further price rises for both raw materials (oilseeds) and oils. The impact on the costs to the food industry could therefore rise if the price of these replacement rapeseed and sunflower oils were to be higher than the GM soybean derived oil previously used.

From a legal perspective, the proposed opting out framework and the potential national restrictions adopted thereunder may be challenged by relevant EU trading partners (such as Argentina, Brazil and the USA) before the World Trade Organization (WTO), on grounds that they are inconsistent with the EU's international trade commitments. If implemented, the opting out system and national measures may be found to contravene core principles of the General Agreement on Tariffs and Trade (GATT), namely the non-discrimination obligations and the prohibition of import restrictions. In addition, the scheme could be assessed against the Agreement on Technical Barriers to Trade (TBT Agreement), which requires that technical regulations not be more trade-restrictive than necessary to fulfil a legitimate objective. In the event of a WTO challenge, it does not appear immediately necessary that the Agreement on Sanitary and Phytosanitary Measures (SPS Agreement) be applicable, inasmuch as potential national opting out measures would not be based on risks for health or the environment. However, as per the experience of previous WTO litigation on the EU's GMO policy (EC – Biotech dispute),[11] the possibility that the SPS Agreement be violated as a result of the opting out system should not be excluded.

The GMO opt out scheme also casts doubts on its compatibility with the EU's domestic principles. Inter alia, the opt out proposal and potential national restrictions look poised to create obstacles in the internal market that may not be justifiable under the Treaty on the Functioning of the European Union (TFEU). In the event that an action for annulment was instituted, the Court of Justice of the

[11] DS291, DS292 and DS293.

European Union (CJEU) could eventually devoid the relevant measure of any legal effect, by annulling it either in part or as a whole.

8. Conclusion

In the event that the European Commission's proposal to opt out on the domestic use of GM products is adopted, the future of these countries' livestock industry will be put at risk. First and foremost, the adoption and implementation of the proposal will place this industry at a significant competitive disadvantage vis-à-vis its competitors in non-opting out Members States and third countries, in as much as it will be required to pay the high costs for non-GM soybean meal or alternatives. In addition, replacing GM soybean meal with domestically-grown oilseed and protein feedstuffs is not a feasible and practical alternative because of technical and climatic constraints. Lastly, any shift to producing more domestically grown proteins and oilseeds would likely result in the EU losing its status as one of the world's most reliable exporter of high quality grains.

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