

# Economic consequences of EU-unapproved GM maize in US soy

Estimates for the period October 2009 to March 2010

Drs. C.P.A. van Wagenberg

Memorandum 09-071

October 2009

Projectcode 31975

LEI Wageningen UR, Den Haag

LEI Wageningen UR conducts research in the following areas:

-  International policy
-  Development issues
-  Consumers and supply chains
-  Sectors and enterprises
-  Environment, nature and landscape
-  Rural economy and use of space

This report is part of the research area Consumers and supply chains.

This research has been financed by Coceral.

**Economic consequences of EU-unapproved GM maize in US soy; Estimates for the period October 2009 to March 2010**

Wagenberg, C.P.A. van

Memorandum 09-071

16 p., tab.

© LEI, 2009

Reproduction of contents, either whole or in part, permitted with due reference to the source.



LEI is ISO 9000 certified.

# Contents

	<b>Summary</b>	<b>5</b>
<b>1</b>	<b>Introduction</b>	<b>6</b>
<b>2</b>	<b>Economic consequences</b>	<b>7</b>
	2.1 Method	7
	2.2 EU crushing industry	7
	2.3 EU compound feed industry	9
	2.4 EU food sector	10
	2.5 EU animal production	12
	2.6 Economic impact on feed and food chain	12
<b>3</b>	<b>Discussion</b>	<b>14</b>
<b>4</b>	<b>Conclusion</b>	<b>15</b>
	<b>References and websites</b>	<b>16</b>

# Summary

In June 2009 minute traces of GM maize events not yet authorised in the EU were discovered in US soybean and soybean meal consignments. This could result a problem in the period from October to March, because then the EU imports most soy products from the US. This desk study, this study estimates the additional first order<sup>1</sup> costs for the crushing industry, compound feed industry, food sectors and animal producers in case the zero-tolerance policy towards unapproved GM maize varieties in US soy products remains in place from October 2009 until March 2010. Additional first order costs for the EU feed and food industry are estimated at €1,100-€4,000m if EU imports of all soy products remain (Table 1). If crushing of soy beans is stopped in the EU, estimated additional direct costs increase to €1,420-€4,400m. If costs are transferred to the sales prices, additional costs for EU primary production are estimated at €640-€2,250m, or €10 to €35 per tonne of feed, and for the EU food sector at €460-€2,100m. The additional feed costs account for 1.8-6.2% of the farmer purchases of compound animal feed. The additional costs for the food sector account for 4.6-21.3% of the input costs of vegetable oils in the EU-27 and 0.1-0.5% of retail sales in the period from October 2009 to March 2010.

<b>Table 1 Estimated additional first order costs (million €) for the EU food and feed industry</b>		
<b>Industry</b>	<b>Type of costs</b>	<b>Estimated additional first order costs (million €) a)</b>
<i>Crushing of soy beans remains in the EU</i>		
Crushing industry	Sourcing costs soy beans	160-650
Compound feed industry	Sourcing costs soybean meal	290-700
	Sourcing costs other protein rich feed stuffs	210-1,010
Food sector	Sourcing soybean oil	40-150
	Sourcing other vegetable oils	380-1,460
Total		1,090-3,980
<i>No crushing of soy beans in the EU</i>		
Crushing industry	Foregone margin	230-260
Compound feed industry	Sourcing costs soybean meal	420-1,010
	Sourcing costs other protein rich feed stuffs	210-1,010
Food sector	Sourcing soybean oil	170-650
	Sourcing other vegetable oils	380-1,460
Total		1,420-4,390

a) Costs are not transferred to the selling price.

<sup>1</sup> Including additional sourcing costs due to increased prices of agricultural commodities, and foregone revenues if processing is stopped due to insufficient availability of the commodities

# 1 Introduction

---

In June 2009 minute traces of GM maize events not yet authorised in the EU were discovered in US soybean and soybean meal consignments. Mid-July, a considerable volume of US soy meal was denied access to the EU, because of a non-quantifiable presence of a not yet authorised GM event. Potentially damaging to all importers of agricultural commodities, the situation is particularly acute for those operators reliant on imports of US soy products, due to insufficient European stocks and inadequate alternative sources. The EU Food and Feed Chain<sup>1</sup> (EUFFC) roughly estimated the economic impact of a total loss of US soy bean imports from October 2009 to March 2010 to be in a range of €3.5 to 5bn (EUFFC, 2009). EUFFC (2009) provides information on the state of the soy bean market and on the economic implications for the various stages in the feed and food chain in case the zero-tolerance policy towards unapproved GM maize varieties in US soy bean remains between October 2009 and March 2010.

This study aims to provide improved estimations of the first order economic costs for the crushing industry, compound feed industry, food sector, and animal production in case the zero-tolerance policy towards unapproved GM maize varieties in US soy product consignments remains from October 2009 to March 2010.

---

<sup>1</sup> Following EU Associations belong to the EU Food and Feed Chain, amongst others: Copa/Cogeca, Coceral, Fediol, Fefac, Ferm, CIAA, UECEBV.

## 2 Economic consequences

### 2.1 Method

A desk study was performed on the additional first order costs in case the zero-tolerance policy towards unapproved GM maize varieties in US soy bean remains in place from September 2009 to March 2010. EUFFC (2009) was used as a starting point.

Two scenarios were distinguished in calculating the additional first order costs for the EU food and feed supply chain. The first scenario assumes imports and crushing of soy beans and compound feed production in the EU remains at the level of 2008/09. The second scenario assumes a complete stop of soy bean crushing in the EU during this period but compound feed production remains at the level of 2008/09. In both scenarios soy bean, soybean meal, and soybean oil will have to be sourced outside the US, shifting world trade flows. It is probable, for example, that US soy products will go to non-EU countries, whereas soy from South America will go to the EU. In the second scenario, the compound feed industry and food sector will also have to source additional non-US soybean meal and soybean oil. These shifting trade flows will result in additional transaction costs for searching and transport. In addition, increased soy product prices for the EU can be expected. Prices increase because of the 'market costs', the additional price to be paid for raw materials if the EU demand must be sourced from a lower available supply, i.e. world supply without the US supply. Prices increase more if EU demand is closer to supply. In addition, a substitute effect will increase the prices of substitutes for these products. The feed industry will change the composition of compound feed if soybean meal prices increase, replacing soybean meal with other protein rich raw materials. All companies will, at least to some extent, include the additional costs into the sales prices, resulting in increased consumer prices for products produced with soy.

This study only calculated the first order costs related to the crushing industry, compound feed industry, food sectors, and animal production in the EU. It does not consider other markets further down the supply chain until the consumer. Second order economic effects as for example the effects of increased prices of soy substitute products on other food products and the soy bean crushing stop on the labor market, were no part of this study. This study assumes meat production remains in the EU. The economic effects of switching from meat production in the EU to meat import from outside the EU was outside the scope of this study. Unless mentioned, costs were calculated assuming that the imported volumes of soy beans, soybean meal, soybean oil and their substitutes remain equal to the period prior to October 2009.

### 2.2 EU crushing industry

The EU crushing industry will face additional first order costs due to an increased price of soy beans as a result of insufficient availability. Therefore, it is needed to distinguish between available supplies and exportable supplies in the US on the one hand and in the rest of the world on the other hand.

From the marketing year 2007/08 to 2008/09 world soy bean production decreased by 4.7% (10.5m t) and production outside the US decreased by 12.3% (18.2m t), mainly because of a drop in production in South America (Table 2.1). A marketing year runs from October to September. In this period world stocks of soy beans decreased by 22.5% (11.9m t) and stocks in South America with 29.3% (12.0m t) to 38m t.

EU imports of soy beans decreased with 2.3m t to 12.8m t from the marketing year 2007/08 to 2008/09, but this was compensated by increased imports of mainly rapeseed (USDA-FAS, 2009). Production volumes of other oil seeds produced in 2009/10 are expected to be comparable with the volumes produced in 2008/09. Imports of soy beans of non-EU member states in marketing year 2009/10 are expected to be at the same level as in the two previous marketing years. To ensure the needed supply of soybean meal in the EU, a soy bean import volume of around 13m t in the marketing year 2009/10 is needed. For the period from October 2009 to March 2010, this amounts to a demand of 6.5m t of soy beans. Usual, as the exporting countries in South America already marketed nearly all of their exportable surplus in this period, most of these imports will be imported from the US.

<b>Table 2.1</b>		<b>Soy bean production (thousand tonnes)</b>				
<b>Country</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10 a)</b>	
<b>Production</b>						
US	83,507	87,001	72,859	80,536	87,067	
Brazil	57,000	59,000	61,000	57,000	60,000	
Argentina	40,500	48,800	46,200	32,000	51,000	
China	16,350	15,967	14,000	16,000	15,400	
India	7,000	7,690	9,470	9,100	10,000	
Paraguay	3,640	5,856	6,900	3,800	5,750	
Canada	3,161	3,460	2,700	3,300	3,650	
Other	9,512	9,337	8,048	8,887	9,207	
<b>Total</b>	<b>220,670</b>	<b>237,111</b>	<b>221,177</b>	<b>210,623</b>	<b>242,074</b>	
<b>Import</b>						
China	28,317	28,726	37,816	39,100	38,100	
EU-27	13,937	15,291	15,123	12,800	12,400	
Japan	3,962	4,094	4,014	3,450	3,950	
Mexico	3,667	3,844	3,614	3,100	3,490	
Taiwan	2,498	2,436	2,149	1,830	2,250	
Thailand	1,473	1,532	1,753	1,500	1,705	
Indonesia	1,187	1,309	1,147	1,200	1,600	
Turkey	1,078	1,268	1,277	950	1,280	
Egypt	776,000	1,328	1,061	1,030	1,200	
South Korea	1,190	1,231	1,232	1,130	1,200	
Other	6,044	8,003	8,971	7,298	7,368	
<b>Total</b>	<b>64,129</b>	<b>69,062</b>	<b>78,157</b>	<b>73,388</b>	<b>74,543</b>	
<b>Ending stocks</b>						
Argentina	16,473	22,606	21,760	15,235	20,310	
Brazil	16,641	18,190	18,902	13,380	14,895	
China	4,573	2,700	4,245	7,510	7,060	
US	12,229	15,617	5,580	3,003	5,723	
EU-27	733	1,118	814	508	590	
Other	2,558	2,654	1,617	1,366	1,744	
<b>Total</b>	<b>53,207</b>	<b>62,885</b>	<b>52,918</b>	<b>41,002</b>	<b>50,322</b>	

a) Estimate from August 2009. Source: USDA-FAS (2009).

The lower world supply of soy beans outside the US combined with an unchanged demand, will result in extra pressure on the soy bean market and increased soy bean prices. In the marketing year 2007/08 low harvests and stocks of major agricultural commodities (wheat, maize, soy, etc.), the new demand for biofuels from the EU, and speculation on raw materials led to low availability of soy for the EU. In addition, in the spring of 2008 MON89788 (Roundup Ready 2 Yield soy) was planted in the US for the first time, whereas EU authorisation was only granted on 4 December 2008. The increased soy bean prices in marketing year 2007/08 could be used as an indication for the increased price in the October 2009-March 2010 period. From 2007/08 onward soy bean demand from China was more than 30% higher (over 9m t increase) than in the previous years. A comparison of prices in 2007/08 with those in the previous years is therefore less useful. In comparing prices in 2007/08 with those in 2008/09, however, the price impact of the low harvests and stocks of major agricultural commodities (wheat, maize, soy, etc.), the new demand for biofuels from the EU, and speculation on raw materials in 2007/08 should also be considered. Therefore, the additional price of soy beans in 2007/08 compared to 2008/09 can be used as a maximum for the increased price in the October 2009-March 2010 period. Compared to the marketing year 2008/09, soy bean prices in Rotterdam were USD134 tonne (€100) higher in 2007/08 (Table 2.2). Soy market experts estimate the additional costs will be at least €25 per ton,



because Brazil has already marketed most of its soy for the next months. This study uses this number as a minimum for the increased price in the October 2009-March 2010 period. For 6.5m t of soy beans this amounts to between €163m and €650m additional sourcing costs for the EU crushing industry.

Year	Soy bean prices (USD/tonne)			
	US	Brazil	Argentina	Rotterdam
2007/08	452	472	469	550
2008/09 a)	361	392	385	416
additional price 2007/08 compared to 2008/09	91	80	84	134

a) October 2008 until July 2009.  
Source: USDA-FAS (2009).

The additional sourcing costs will be, at least partially, included in the sales price of the soybean oil and soybean meal. If soy bean prices increase too much, the additional sourcing costs cannot be forwarded into the sales price sufficiently and production will be stopped. The maximum costs for the crushing industry itself are thus the costs that occur when production is stopped. The costs when production is stopped are the foregone revenues minus the foregone variable costs. EUFFC (2009) estimated this at €35 to €40 per tonne soy beans. For 6.5m t soy beans, this results in maximum direct costs of between €230 and €260m for the EU crushing industry in the period from October 2009 to March 2010. Note that indirect costs in the economy are not included in this figure.

### 2.3 EU compound feed industry

The EU compound feed industry will face additional first order costs due to an increased price of soybean meal and of other protein rich raw materials for feed.

USDA-FAS (2009) estimated that the EU will import 23.3m t of soybean meal in the marketing year 2009/10, almost all used in the production of compound animal feed. Soybean meal imports have been stable the last 4 marketing years with volumes between 22.2 and 24.1m t. Assuming an equal distribution<sup>1</sup> of soybean meal imports within a year, soybean meal imports from October 2009 to March 2010 are estimated at 11.7m t.

Comparable to soy beans, low harvests and stocks of major agricultural commodities, the new demand for biofuels from the EU, and speculation on raw materials increased prices of soybean meal in the marketing year 2007/08, which can be used as an indication for the increased price in the October 2009-March 2010 period. The additional price of soybean meal in 2007/08 compared to 2008/09 is used as a maximum for the increased price in the October 2009-March 2010 period. Compared to the marketing year 2008/09, soybean meal prices in Hamburg were USD77 tonne (€60) higher in 2007/08 (Table 2.3). As with soy beans, this study uses the soy market experts estimate of at least €25 per tonne additional costs in the October 2009-March 2010 period. For 11.7m t of soybean meal sourced outside the EU this amounts to between €293m and €702m additional sourcing costs for the EU compound feed industry. The additional sourcing costs will be, at least partially, included in the sales price of the feed sold to animal producers.

<sup>1</sup> Although the compound feed use in winter probably exceeds that in summer, especially for cattle.

<b>Table 2.3 Soybean meal prices 1997-2009 (USD/tonne)</b>				
<b>Year</b>	<b>Soybean meal prices (USD/tonne)</b>			
	<b>US</b>	<b>Brazil</b>	<b>Argentina</b>	<b>Hamburg</b>
2007/08	370	337	299	469
2008/09 <sup>a</sup>	351	321	283	392
additional price 2007/08 compared to 2008/09	19	16	16	77

<sup>a</sup> October 2008 until July 2009.  
Source: USDA-FAS (2009).

In addition to imports, soybean meal will come be available on the market from soy beans crushed in the EU. For the period from October 2009 to March 2010, 6.5m t of soy beans are expected to be imported if crushing amounts are not reduced due to potential presence of minute traces of not yet EU approved GM maize events. This accounts for 5.2m t of soybean meal (crushing soy beans results in 80% meal and 20% oil). If crushing amounts will not be reduced, the price for soybean meal produced in the EU will go up comparable to the world market prices. These additional prices incur additional sourcing costs for the compound feed industry between €130 and €312m. However, these additional sourcing costs for the EU compound feed industry are increased revenues for the EU crushing industry and decrease the economic impact for them. These additional costs are therefore already included in the additional costs calculated for the EU crushing industry.

If the EU crushing industry stops crushing, the EU compound feed industry has to increase the import of soybean meal by 5.2m t during the period from October 2009 to March 2010. The cost for the EU compound feed industry will further increase by between €130 and €312m to between €423 and €1,014m.

If prices of soybean meal increase, the prices of other protein rich raw materials for animal feed also increase. Table 2.4 compares the hypothetical mean compound feed price if soy prices increase and the prices of other raw materials do not change, with the feed price if the prices of other raw materials also increase from Aramyan et al. (2009). Roughly, the real increase is between 1.5 and 2 times higher than the hypothetical increase. This means that the additional sourcing costs for the compound feed industry for protein rich raw materials, not being soybean meal, are estimated between 50% and 100% of the additional sourcing costs for soybean meal. The additional sourcing costs for other protein rich feed stuffs are estimated between €212 (0.5 \* (€293 + €130m)) and €1,014m (= €702 + €312m) for the period from October 2009 to March 2010. Part of these other protein rich raw materials could be sources from inside the EU. These numbers are therefore a maximum for the additional costs of the EU feed and food sector.

<b>Table 2.4 Comparison of the hypothetical compound feed prices if soy prices increase and the prices of other raw materials do not change, with the real compound feed price if the prices of other raw materials do increase</b>					
Soy price (€/tonne)	290	340	390	490	690
Hypothetical mean price compound feed a)	0.0	+4.0	+7.9	+15.9	+31.7
Real layer hen feed price b)	198	+6.5	+13.5	+39.0	+60.0
Real broiler feed price b)	236	+5.0	+13.0	+28.5	+51.0
Real sow feed price b)	180	+6.5	+12.5	+26.5	+48.0
Real finishing pig feed price b)	190	+5.0	+10.0	+20.0	+35.0
Real cattle feed price b)	185	+4.0	+10.0	+20.0	+40.0

a) At 23% soy content: e.g. +4.0% = (340/290-1)\*23%; b) Source: Aramyan et al. (2009).

## 2.4 EU food sector

The EU food sector will face additional first order costs due to an increased price of soybean oil and other vegetable oils.

The EU is a net importer of major vegetable oils. USDA-FAS (2009) estimates that the EU will produce 15.45m tonnes and will import another 8.48m tonnes in the marketing year 2009/10. Major vegetable oil im-

ports have been stable the last 4 marketing years with volumes between 8.41 and 9.09m tonnes. Assuming an equal distribution within a year, major vegetable oil production and imports from October 2009 until March 2010 are estimated at 7.73m tonnes and 4.24m tonnes respectively.

USDA-FAS (2009) estimates EU soybean oil production in the marketing year 2009/10 at 2.18m tonnes and imports at 0.80m tonnes. Assuming an equal distribution within a year, soybean oil production and imports from October 2009 to March 2010 are estimated at 1.10m tonnes and 0.40m tonnes respectively.

Comparable to soy beans, low harvests and stocks of major agricultural commodities, the new demand for biofuels from the EU, and speculation on raw materials increased prices of soybean oil in the marketing year 2007/08, which can be used as an indication for the increased price in the October 2009-March 2010 period. The additional price of soybean oil in 2007/08 compared to 2008/09 is used as a maximum for the increased price in the October 2009-March 2010 period. Compared to the marketing year 2008/09, soybean oil prices in Rotterdam were USD 509 tonne (€380) higher in 2007/08 (Table 2.5). EUFFC (2009) estimated a minimum price increase of €100 per ton. For 0.40m t of soybean oil sourced outside the EU this amounts to between €40m and €152m additional sourcing costs for the EU food sector.

Year	Soybean oil prices (USD/tonne)			
	US	Brazil	Argentina	Rotterdam
2007/08	1,147	1,190	1,191	1,327
2008/09 a)	708	731	726	818
additional price 2007/08 compared to 2008/09	439	459	465	509

a) October 2008-July 2009.  
Source: USDA-FAS (2009).

In addition to imports, soybean oil will come available from soy beans crushed in the EU. For the period from October 2009 to March 2010, 6.5m t of soy beans are expected to be imported if crushing amounts are not reduced. This accounts for 1.3m t of soybean oil (crushing soy beans results in 80% meal and 20% oil). If crushing amounts are not reduced, price for soybean oil produced in the EU will go up comparable to the world market prices. These additional prices incur additional sourcing costs for the compound feed industry between €130 and €494m. However, these additional sourcing costs for the EU food sector are increased revenues for the EU crushing industry and decrease the economic impact for them. These additional costs are therefore already included in the additional costs calculated for the EU crushing industry.

If the EU crushing industry stops crushing, the EU food sector has to increase the import of soybean oil with 1.3m t in the period from October 2009 to March 2010 and total cost for the EU food sector will increase with €130 to €494m to between €170 and €646m.

If prices of soybean oil increase, the prices of other major vegetable oils also increase. It is expected that the EU food sector will import 3.84m tonnes of vegetable oil (= 4.24 - 0.40), not being soybean oil. The weighted average price for major vegetable oils in the marketing year 2007/08 was €500 per tonne higher compared to the prices in 2008/09. This, however, seems very high compared to the soybean oil price increase due to potential presence of minute traces of not yet EU approved GM maize events. Increased price for other vegetable oils is therefore estimated in the same range as for soybean oil. Additional costs for the EU food sector are between €384m and €1,459m for the period from October 2009 to March 2010 for imported vegetable oils, not being soybean oil.

In addition to the increase in the price of imported vegetable oils, the price of vegetable oils produced in the EU will increase. USDA-FAS (2009) estimates the EU consumption of vegetable oil in the marketing year 2009/10 at 23.23m tonnes. With the above mentioned price increases, additional costs for the food sector could be as high as €2,323 to €8,827m. However, assuming that the oils produced in the EU originate from EU based farmers, these additional costs for the EU food sector are an additional income for EU based farmers. Because this research estimates additional costs on EU level, the costs shifted between one EU sector to another EU sector are not included.

## 2.5 EU animal production

The EU animal production will face additional first order costs due to an increased price of compound feed. The EU Food and Feed Chain estimated in the dossier that the EU will produce about 65m t of compound feed during the period from October 2009 to March 2010. With an estimated 16.9m t of soybean meal being produced (5.2) and imported (11.7) in the EU in this period, soybean meal content in compound feed is estimated at 26.0%. If soy bean crushing remains in the EU and the EU compound feed industry includes their additional costs of €635 to €2,236m in the compound feed prices (80% of the additional crushing costs), compound feed prices will increase between €10 and €34 per ton. For the Netherlands, for example, this will increase animal production costs between 3 and 11% for the poultry and pigs, and with maximum 1% for cattle (Table 2.6). If soy bean crushing stops in the EU, additional costs for EU animal production are estimated at €635 to €2,028m or €10 to €31 per tonne.

	<b>Compound feed price now a)</b>	<b>Increased compound feed price</b>	<b>compound feed use a)</b>	<b>Current production costs a)</b>	<b>Extra production costs at increased price</b>
Animal type	(€/ton)	(€/ton)	kg/animal	€/animal	Factor increase
Layer hens	198	208-232	4,210 b)	1,247 b)	3-11%
Broilers	236	246-270	370 b)	128 b)	3-10%
Sows	180	190-214	1,974	737	3-9%
Finishing pigs	190	200-224	247	92	3-9%
Cattle	185	195-219	225 c)	962	0-1%

a) Numbers for the Netherlands; source: KWIV-V 2009-2010; b) Per 100 animals. c) Compound feed used in the Netherlands with elevated level of protein.

## 2.6 Economic impact on feed and food chain

Additional sourcing costs if crushing remains in EU and the costs are not transferred to the selling price are estimated between €1,100 and €4,000m in the period from October 2009 to March 2010 (Table 2.7). More than half the additional costs are caused by the substitute effect of soy product prices on the prices of protein rich feed stuffs and vegetable oils. Additional sourcing costs of soybean meal and soybean oil if crushing stops in EU increase the estimated costs to the range of €1,400 to €4,400m in this period (Table 2.8). Differences between estimated additional costs for each sector between the scenarios are small compared to the range within a scenario.

If the industry will transfer all additional costs to their selling prices, additional costs will occur only at the end of a chain, in this case the primary animal production and food industry. Additional costs for EU animal production are estimated at €640 to €2,240m in the period of October 2009 until March 2010. For the food sector, additional costs in this period are estimated at €460 to €2,100.

<b>Table 2.7</b>		
<b>Estimated additional first order costs (million €) for the EU food and feed industry if crushing remains in the EU</b>		
<b>Industry</b>	<b>Type of costs</b>	<b>Estimated additional first order costs (million €) a)</b>
Crushing industry	Sourcing costs soy beans	163-650
Compound feed industry	Sourcing costs soybean meal	293-702
	Sourcing costs other protein rich feed stuffs	212-1,014
Food sector	Sourcing soybean oil	40-152
	Sourcing other vegetable oils	384-1,459
<b>Total</b>		<b>1,092-3,977</b>

a) Costs are not transferred to the selling price.

<b>Table 2.8</b>		
<b>Estimated additional first order costs (million €) for the EU food and feed industry if crushing is stopped in the EU. Cost are attributed to the sector that makes the initial additional costs. Additional costs are not distributed over the sectors by forwarding costs into the selling price</b>		
<b>Industry</b>	<b>Type of costs</b>	<b>Estimated additional first order costs (million €) a)</b>
Crushing industry	Foregone margin	230-260
Compound feed industry	Sourcing costs soybean meal	423-1,014
	Sourcing costs other protein rich feed stuffs	212-1,014
Food sector	Sourcing soybean oil	170-646
	Sourcing other vegetable oils	384-1,459
<b>Total</b>		<b>1,419-4,393</b>

a) Costs are not transferred to the selling price

### 3 Discussion

---

This study estimated the additional first order costs for the crushing industry, compound feed industry, food sectors and animal producers in case the zero-tolerance policy towards unapproved GM maize varieties in US soy products remains from October 2009 until March 2010. Results showed that estimated additional first order costs for the EU feed and food industry were €1,100-€4,000m if EU imports of all soy products remain. If crushing of soy beans is stopped in the EU, estimated additional first order costs increased to €1,420-€4,400m. If costs are transferred to the sales prices, additional first order costs for EU primary production are estimated at €640-€2,240m and for the EU food sector at €460-€2,100m.

The range between the minimum and maximum additional first order costs estimates is rather big. Additional costs are mainly caused by increased prices of raw materials sources outside the EU. A wide range in prices is presented, because it is difficult, if not impossible, to give an accurate prediction of the additional price due to the stop of soy products from the US. Prices from the period with the MON89788 event can only provide an indication, due to differences between this period and the current situation in stock and production levels of major agricultural commodities (wheat, maize, soy, etc.), in world demand, e.g. new demand for biofuels from the EU, and in speculation on raw materials.

It must be emphasised that this study calculated first order costs. It did not include second order effects. This study only estimated the economic effect until animal production and the food sector, it did not include markets further down the supply chain until the consumer. The second order effects and markets further down the supply chain could increase total costs for the EU feed and food industry. This study further assumed that the imported volumes of soy beans, soybean meal, soybean oil and their substitutes remain equal to the period prior to October 2009. Companies can search for alternative inputs, that could become economically viable with increased prices of soy products, resulting in lower total expected cost for the EU feed and food industry. Finally, this study only estimated costs up to March 2010. If the EU allows minute traces of unapproved GM maize varieties in US soy bean before March 2010, costs will be substantially lower. If the situation with a zero-tolerance for minute traces continues after March 2010, costs will be higher than the costs estimated in this study. Further research is needed to determine the impact of these effects.

The estimated costs in this study are lower than the first estimates of EUFFC (2009). EUFFC calculated lost turnover as costs for the crushing industry, thereby including foregone variable costs into the costs. Furthermore, they summed the additional raw material costs for the compound feed industry and the additional feeding costs for the animal producers both as costs counting these cost twice.

Comparing the estimated costs for the EU feed and food industry with the sales value puts the estimates into perspective. FEFAC (2007) reported that farmer purchases of compound feed in the EU amounted to €36bn. in 2006. If farmer purchases of compound feed are equal in 2009/10, the expected additional costs for the feed industry are between 1.8 and 6.2% of the farmer purchases in the period from October 2009 to March 2010. For vegetable oils, USDA-FAS (2009) estimated the domestic consumption in the EU-27 in 2009/10 at 23.23m tonnes. With an average input price of around €850 per tonne, total input costs for vegetable oils in the EU-27 are estimated at €9,870m in the period from October 2009 to March 2010. The expected additional costs for the food sector are between 4.6 and 21.3% of the input costs of vegetable oils in the EU-27 in the period from October 2009 to March 2010. If it is assumed that these oils all are used in food products, these costs will in the end increase consumer prices. The retail sales in the EU 27 in 2005 were estimated at €800,000m (Eurostat). If retail sales in 2009/10 would equal this number, the retail sales in the period from October 2009 to March 2010 would be €400,000. The expected additional costs for the food sector are between 0.1 and 0.5% of the retail sales in the period from October 2009 to March 2010.

## 4 Conclusion

---

The additional first order costs for the crushing industry, compound feed industry, food sectors and animal producers in the EU in case the zero-tolerance policy towards unapproved GM maize varieties in US soy products remains from October 2009 until March 2010, are estimated at €1,100-€4,000m if EU imports of all soy products remain. If soy bean crushing is stopped in the EU, the estimate increases to €1,420-€4,400m. The additional feed costs account for 1.8-6.2% of the farmer purchases of compound animal feed. The additional costs for the food sector account for 4.6-21.3% of the input costs of vegetable oils in the EU-27 and 0.1-0.5% of retail sales in the period from October 2009 to March 2010.

## References and websites

---

Aramyan, L.H., C.P.A. van Wagenberg and G.B.C. Backus, *EU policy on GM soy: Impact of tolerance threshold and asynchronous approval for GM soy on the EU feed industry*. Report 2009-052, LEI Wageningen UR, The Hague, The Netherlands.

EUFFC, *Food and feed chain dossier with regard to minute presence of GM events not yet authorised in the EU in imported raw materials, notably soy and soy beans: Market situation & Economic implications*. EU Food and Feed Chain, version 15 July 2009.

FEFAC, *Feed & Food: Statistical Yearbook 2007*. FEFAC, Brussels, Belgium, 2007.  
<<http://www.fefac.org/file.pdf?FileID=17088>>

USDA-FAS, *Oilseeds: World market and trade*. FOP 8-09, USDA-FAS, August 2009.