Assessment of the Scope for the Development of Vegetable Protein Production in the EU

Final Report for the European Parliament

by Bureau Européen de Recherches (Agra CEAS Consulting), Brussels
in conjunction with O’Connor and Co., Brussels

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# Contents

1. **BACKGROUND AND OBJECTIVES** ........................................................................................................... 3

2. **EVOLUTION OF SUPPLY AND DEMAND OF KEY PROTEIN CROPS** ............................................. 5

3. **CURRENT REGULATORY FRAMEWORK** ............................................................................................ 11
   3.1. **AGENDA 2000** .................................................................................................................................. 11
   3.2. **CAP MID TERM REVIEW (MTR)** .................................................................................................. 13
   3.3. **BLAIR HOUSE AGREEMENT** ........................................................................................................ 14
   3.4. **MBM BAN** ..................................................................................................................................... 14

4. **AGRONOMIC ANALYSIS** ......................................................................................................................... 16
   4.1. **OVERVIEW** .................................................................................................................................... 16
   4.2. **SOURCES OF VEGETABLE PROTEIN & NUTRITIONAL PROPERTIES** ........................................... 16
   4.3. **ASSESSMENT OF SUITABILITY FOR USE IN ANIMAL FEED** ..................................................... 19
   4.4. **AGRONOMIC ASSESSMENT OF PRODUCTION POTENTIAL** ....................................................... 20
   4.5. **CONCLUSIONS** ............................................................................................................................. 22

5. **LEGAL ANALYSIS** ................................................................................................................................. 27
   5.1. **OVERVIEW** ..................................................................................................................................... 27
   5.2. **HISTORICAL BACKGROUND OF THE US-EC OILSEEDS DISPUTE** ........................................... 28
   5.3. **THE EU OILSEEDS REGIME AND THE MEMORANDUM ON OILSEEDS** ....................................... 30
   5.4. **LEGAL ASSESSMENT** ..................................................................................................................... 31
      5.4.1. **The applicability of the Memorandum on Oilseeds** ................................................................... 32
      5.4.2. **Implications in case on non-applicability** ................................................................................. 33
         (a) **The “Blue Box” exemption** ........................................................................................................ 34
         (b) **The “Green Box” Exemption** ..................................................................................................... 35
         (c) **Subsidies included in the Aggregate Measurement of Support** ................................................... 37
      5.4.3. **Risk of challenge by the United States** ..................................................................................... 38
      5.4.4. **Alternative actions in case of continuing applicability** ............................................................. 38
   5.5. **CONCLUSIONS** ............................................................................................................................... 40

6. **ECONOMIC ANALYSIS** .......................................................................................................................... 40
   6.1. **OVERVIEW** ..................................................................................................................................... 40
   6.2. **COMPETITIVENESS OF VEGETABLE PROTEIN PRODUCTION** .................................................. 40
   6.3. **EXISTING FORECASTS ON EU VEGETABLE PROTEIN SUPPLY** ............................................... 46
      6.3.1. **Current EU-15** .......................................................................................................................... 46
      6.3.2. **EU enlargement effects** .......................................................................................................... 48
   6.4. **SCENARIOS FOR AN INCREASE IN EU PROTEIN CROP PRODUCTION** .................................... 51
   6.5. **ECONOMIC ASSESSMENT** ............................................................................................................. 52
   6.6. **CONCLUSIONS** ............................................................................................................................... 53
1. Background and objectives

Bureau Européen de Recherches SA (Agra CEAS Consulting) submitted a tender for the European Parliament (EP), Directorate General for Research, on the ‘Development of vegetable protein production in the European Union’ in spring 2002 and was awarded the contract to undertake this research in June 2002. The work was undertaken in the period July-October 2002 by the following individuals and institutions. The legal analysis was conducted by O’Connor and Co. in Brussels, the agronomic analysis was undertaken by Dr. David Scarisbricke who is a Senior Lecturer at Imperial College, University of London. The project was directed by Mr. Conrad Caspari of Agra CEAS Consulting and the economic analysis was undertaken by Dr. Maria Christodoulou and Dr. Edward Oliver of Agra CEAS Consulting.

The EU-15 is in deficit as far as its requirements for vegetable protein for animal feed are concerned. Some 70% of the EU’s requirements are imported, primarily in the form of soybeans, and the bulk of these imports comes from Brazil, Argentina and the United States. This import dependence represents a vulnerability for the Union which was highlighted by the 1973 US export embargo on soya. In response to this crisis the EU started to develop measures to increase self-sufficiency for oilseeds from the mid 1970s onwards. These measures, together with the accession of countries with a stronger capacity to produce oilseeds during the 1980s, resulted in increases in self-sufficiency for these products to some 38% by 1991. This self-sufficiency level has, however, since fallen to some 30% as a result of the fact that policy changes over the last decade have made the production of oilseeds relatively less attractive for producers, as well as due to the ceilings on production areas and volumes resulting from the Blair House agreement. The self-sufficiency problem has been exacerbated by the fact that demand for vegetable proteins is rising by some 3% per year and that, since 2001, there has been a ban on the use of meat and bone meal (MBM) in livestock feed resulting from the BSE crisis of autumn 2000¹.

The general aim of the study, as set out in the EP’s terms of reference, is therefore to establish whether there is scope to expand the production of vegetable protein within the EU-15. The specific objectives of the research are as follows:

(i) to provide an overview of the evolution or production of, and the policy for vegetable protein production;
(ii) to review the different sources of vegetable protein and assess their value in terms of livestock feeding;
(iii) to analyse the legal issues surrounding the expansion of protein crops and review the legal constraints currently applying to an expansion of vegetable protein production in the EU;

¹ On 1 January 2001, the EU instituted a 6-month ban on the feeding of MBM to any farmed animal kept for food production (Decision 2000/766/EC). This was extended for an indefinite period in June 2001, pending new legislation that will regulate the disposal of animal waste. It should be noted that the ban mainly affects pig and poultry meat production, as the use of animal meals for ruminants was already forbidden for a number of years in the EU.
(iv) to investigate different methods (or scenarios) that will increase vegetable protein production and improve the EU’s trade balance and assess their impact in terms of volume and budget.

It should be noted that, in the course of this study, in September 2002, the European Parliament adopted a resolution on the Commission Communication to the Council and EP on options to promote the cultivation of plant proteins in the EU [(COM(2001)148f of 16/3/2001)]. The study takes into account, where applicable, the points raised by both documents.
2. Evolution of supply and demand of key protein crops

We concentrate in this study on the key vegetable proteins used in animal feed in the EU-15 (Figure 1). These are:

- **Cereals**: 40%, by volume, of all raw materials currently used in compound feed are cereals making this industry the largest user of home-grown cereals. The most important crop is wheat (39% of total cereal feed consumption), followed by barley and maize (27% each). Rye, oats and sorghum have only minor shares. Last decade has been marked by a very sharp rise in cereal use in feed (a 9 percentage point increase in the cereal market share of the animal feed market and a global production increase of some 30 mn t) (Figure 2). This is attributed both to the rapid development of white meat production (poultry) and the dramatic improvement in EU cereals competitiveness (following the implementation of the 1992 CAP reform). Imports of cereals for use in animal feed from non-EU countries are relatively limited.

- **Oilseeds**: oil meals account for another 26% of raw material usage in compound feed, and their share has remained relatively stable during the last decade. A large quantity of oilseed meals (some 75% of EU vegetable protein requirements) are imported given the important protein deficiency in the EU (Figure 3), and this makes the EU the largest importer of oilseed proteins in the world. The most significant crop is soybeans (73% of total oilseed meal consumption), while rapeseed and sunflower have relatively small shares (16% and 11%, respectively).

- **Protein crops**: these account for a minor (3.5%) and diminishing share of compound feed use and mainly consist of feed peas (the use of beans and sweet lupins is relatively limited). The EU is virtually the only region in the world where these crops are used in animal feeding. Over 90% of this production is in fact consumed by the pig industry.

Figure 1   Key vegetable proteins used in compound feed in the EU (2000)
As indicated above, the animal feed sector represents the main outlet for EU cereals (116 mn t in 2000/01) (Figure 3). Cereal consumption has increased by 16.4 mn t (or 49%) in the compound feed sector alone in the period 1990 to 2000 (Figure 2). Non-grain feed ingredients are losing market share as they are being replaced by cheaper feed grains in rations. This is certainly the case for manioc products and corn gluten feed. The use of animal meals has also fallen significantly, from a 3% share in 1990 to just 1.6% in 2000 (before the MBM ban).

By comparison the relative share of oilseed meals has remained stable in the same period, although within an expanding compound feed sector their actual volume has increased (Figure 2).

**Figure 2  Growth of cereal use in EU compound feed, 1990-2000**

![Figure 2](image_url)

Source: FEFAC

In terms of individual crops, the main vegetable protein used in animal feed is soya, although maize and wheat are also important where high-protein applications are required. Soybean meal will remain the dominant oilmeal, with relatively low prices as a result of abundant supplies on the world market. It is this product, however, that presents the highest deficit of all vegetable proteins (Figure 3).

The EU’s requirements for imported soya, either in the form of seed to process into meal or in terms of finished meal, have been consistently increasing (Figure 4). There is also a significant import requirement for sunflower (seed for processing into meal and finished meal), despite the fact that EU production is relatively developed, although the import volumes are relatively modest compared to soya meal. Only rapeseed shows for the moment a small dependency on imports.
Figure 3  Production and feed use of key vegetable proteins in the EU, 2001

Source: USDA

Figure 4  The significance of EU import requirements in oilseeds

Soya beans

Source: European Commission (EUROSTAT and DG AGRI)
This situation has been aggravated by the introduction of the MBM ban, following which EU self-sufficiency in protein supplies for its livestock sector is now estimated at just 22%. As a result of the ban extra proteins are being imported into the EU for incorporation into animal feeds, and these are estimated to have reached 1.32 mn tonnes (excluding fishmeal). This volume is equivalent to an additional 3 mn tonnes of soybean meal, 4 mn tonnes of rape meal and over 4 mn tonnes of sunflower meal and pulses.
According to FEFAC (the EU compound feed industry federation), if the EU wants to achieve a 100% self-sufficiency in the supply of proteins for animal feeds from home-produced vegetable sources, then it needs to produce a further 17.6 mn tonnes of protein, which would imply the additional use of some 15 mn ha for pea cultivation and 16 mn ha for soya beans. If the EU were to utilise the current 10% of farm land that is under compulsory ‘set aside’, it would gain 4 mn ha of additional farm land to offset the above area required, and by stopping the export of cereals to third countries it would offset the remaining area by a further 4.5 mn ha.

Key producers of most vegetable proteins in the EU, in terms of the land area occupied by each crop, are France, Germany and the UK, while Spain and Italy have significant cultivation of certain crops such as sunflower (Spain being the largest EU producer, followed by France) and grain maize (Italy being the second largest EU producer after France).

**Figure 5  Main producers of vegetable proteins in the EU-15, 2001**

**Cereals**
Oilseeds

Protein crops
3. Current regulatory framework

The most important policy issues affecting the supply outlook for vegetable proteins in the EU are outlined below.

It should be noted that, in addition to policy issues as such, an important factor affecting the outlook for the supply balance of protein crops in the EU is the development of exchange rates (US$:€). In the oilseed meal sector, which is heavily dependent on imports for raw material, the strength of the US$ versus the EURO has made imported oilseed meals more expensive than domestic (and imported) feed grains. The US is the leading supplier of soybeans to the EU (6.7 mn t), closely followed by Brazil (6.1 mn t) (EUROSTAT, October-September 1999/2000), and it is generally forecast that the bulk of additional EU soybean imports will come from Brazil. In the sunflower seed sector, Argentina has been a strong traditional supplier, but with the economic situation in the country and a falling sunflower seed output, EU sunflower seed crushers will become increasingly dependent on Eastern European supplies in the near future (particularly from Russia, Ukraine and the Balkans). The main part of EU rapeseed imports (this product has the smallest deficit of all oilseeds) originates in Central and East Europe (Czech Republic and Hungary account for 78% of total rapeseed imports in 1999/2000), and imports from non-EU sources such as Australia or Canada are heavily dependent on the GMO-free status of supplies from these countries. The EU is also running an important deficit in the case of oilseed meal, the bulk of which is, again, in soybean meal. Nearly three quarters of soybean meal imports come from Latin America (7.7 mn t from Argentina and 6.6 mn t from Brazil in 1999/2000) and this is expected to continue.

3.1. Agenda 2000

In 1999, the Berlin European Council agreed on an overall package of CAP reform. One of the policies pursued by the Agenda 2000 reforms was the gradual decrease in the level of compensatory payments for oilseeds, reflecting general budgetary constraints and the broader goal of ‘decoupling’ subsidies from production.

Table 1 summarises the main points of the Agenda 2000 reforms for protein-rich crops. Following Agenda 2000, area payments for EU oilseeds producers were aligned downwards to those for cereal crops, while those for cereals were aligned upwards to compensate for the two-stage cut in the intervention price. This effectively establishes a single aid payment for cereals, oilseeds and set-aside land, while protein crops benefit from an extra €9.5/t. Thus from 1 July 2002, oilseed payments, both under the main scheme and under a new simplified scheme for small producers, are based on an aid

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2 This is despite the fact that oilseeds and oilseed meals are imported duty-free into the EU. On the other hand, the €10/t import duty on Eastern European and Black Sea cereals was eliminated in late 2001, partly in response to high domestic prices in the EU and partly due to the need for feed grains in Southern Europe, leading to a marked increase in imports of feed cereals (especially wheat and barley) from this region which replaced domestic cereals in feed use.
Other Agenda 2000 changes included the following: the basic compulsory set-aside rate was set at 10% for the entire period 2000-06 (with additional set-aside, on a voluntary basis, left to Member States to decide), although it can be reviewed in the light of supply and market developments; the introduction of modulation on a voluntary basis (so far only adopted by UK and France, although recently suspended in France).

Table 1  Main provisions of Agenda 2000 for protein-rich crops (2000 to 2006)

<table>
<thead>
<tr>
<th></th>
<th>1999/2000</th>
<th>2000/01</th>
<th>2001/02</th>
<th>&gt; 2002/03</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals/Maize, €/t:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• intervention price</td>
<td>119.19</td>
<td>110.25</td>
<td>101.31</td>
<td>101.31</td>
</tr>
<tr>
<td>• area payment</td>
<td>54.34</td>
<td>58.67</td>
<td>63.00</td>
<td>63.00 (2)</td>
</tr>
<tr>
<td>Oilseeds, €/t:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• area payment (1)</td>
<td>94.24</td>
<td>81.74</td>
<td>72.37</td>
<td>63.00 (2)</td>
</tr>
<tr>
<td>Protein crops, €/t:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• area payment</td>
<td>78.49</td>
<td>72.50</td>
<td>72.50</td>
<td>72.50</td>
</tr>
<tr>
<td>Grass silage, €/t:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• area payment (3)</td>
<td>none</td>
<td>58.67</td>
<td>63.00</td>
<td>63.00 (2)</td>
</tr>
<tr>
<td>Set-aside, €/t:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• area payment</td>
<td>68.83</td>
<td>58.67</td>
<td>63.00</td>
<td>63.00 (2)</td>
</tr>
</tbody>
</table>

(1) Up to 2001/02 inclusive, aids may be calculated on the basis of the oilseed yield expressed as a cereal value by applying a factor of 1.95 (ratio of historical average yields for cereals and oilseeds). Starting from the 2002/03 marketing year, all aids will be calculated according to the cereal yield.

(2) Subject to change from the 2002/03 marketing year depending on a possible lowering of the intervention price (cereals) and/or overall review of the sector.

(3) Available in regions where no maize is grown.

The marketing year 2000/01 was the first year of implementation of Agenda 2000 in the arable crop sector (Council Regulation 1251/1999), and these reforms appear to have already brought about a shift into cereal cultivation by a large number of oilseed producers.

Agenda 2000 reforms have led to improved competitiveness of cereals vis-à-vis oilseeds, due to the progressive alignment of area payments for oilseeds to those for other grains, while wheat continues to offer a better agronomic yield potential. With attractive prices for EU feed grains, this has led to an increase in cereal incorporation rates in compound feed, a development which already began a number of years ago. The full implementation of Agenda 2000 is projected to generate a further increase in cereal feed use over the 2002/03–2009/10 period, though at a much more moderate pace than following the 1992 Mac Sharry reform, due to slower growth in meat production and the fact
that the price competitiveness of cereals has not improved by the same amount as under the earlier reform.

Although the introduction of a ‘simplified scheme’ for the payment of the area aid to small producers has provided them with a higher oilseeds payment than previously, leading to an increase in the oilseeds area cultivated by small producers from about 90,000 ha in 1999/2000 to about 558,000 ha in 2000/01, this has had no apparent beneficial effect on the total oilseeds area.

In the protein crops sector (feed peas and other pulses), the crop specific aid applied was reduced as a consequence of Agenda 2000. Again, as in the case of oilseeds, the Agenda 2000 reforms have led to improved competitiveness of cereals vis-à-vis protein crops, given the more attractive prices for cereals and their higher yield potential.

3.2. CAP Mid Term Review (MTR)

In the framework of Agenda 2000 it was agreed that the Commission would submit proposals in 2002 for a mid-term review of the CAP, including for the cereals, oilseeds and protein crops sectors, and agricultural spending. Formal proposals were presented to the Council on 10 July. These outlined the Commission’s plans and rationale in the various sectors concerned and the first political discussion of the proposals took place at the Agriculture Council of 15 July.

In terms of the arable sector, key points of the proposals include:

- a further 5% cut in intervention prices for cereals (an issue already addressed under Agenda 2000); the cut will be accompanied by an additional compensation of 3 €/t in the direct aid payment (i.e. from 63 €/t to 66 €/t);
- abolition of the cereal monthly increment;
- abolition of intervention for rye;
- the conversion of the current €9.5/t supplement for protein crops to a stand-alone, non-modulated protein crop supplement of 55.57 €/ha for traditional production regions;
- and a non-crop specific aid for energy crops of €45/ha, for a maximum guaranteed area of 1.5 mn ha, again based on historical energy crop production.

However, no changes have been proposed for oilseeds as no need for adjustment was felt to be necessary in the sector.

There are also proposals for replacing the current set aside scheme by a compulsory, long-term (10-year), non-rotational set aside at the base rate of 10%, in the context of so-called ‘cross-compliance’ requirements with environmental and other objectives.

In terms of horizontal measures, the proposals call for:
‘decoupling’ direct aids, by converting all existing aids (including those for cereals, oilseeds, protein crops and set-aside) to a decoupled single income payment per farm, based on the total amount of direct aid received during a historical reference period (with the exception of certain new product-specific aids, such as the protein crop supplement);

- linking the decoupled payment to enhanced ‘cross-compliance’ rules (covering environmental issues, animal welfare, food safety, good agricultural practices and farm auditing), according to a common framework;

- the compulsory application of a revamped modulation concept (‘dynamic modulation’), whereby all direct aid payments will be reduced progressively by 3% from 2004 onwards, up to a maximum of 20% (maximum foreseen by Agenda 2000) over 6-7 years (with a “franchise” exempting the first €5,000 of direct aid per 2 full-time workers, incremented by €3,000 per additional worker);

- and capping total aid received per farm to €300,000 a year.

All of the above issues have potential market and supply balance implications for protein-rich crops in terms of the potential effects on land use, especially as there is no explicit obligation attached to the decoupled payment to farm the eligible land (although there is an implicit reference to maintaining the land in ‘good farming condition’).

### 3.3. Blair House Agreement

The 1992 Blair House Memorandum of Understanding on Oilseeds between the US and the EU was an important element of the final Uruguay Round Agreement on Agriculture (URAA). The Blair House Agreement is contained in the EU’s WTO schedule of commitments and resolved a GATT dispute over EU domestic support programs that impaired access to the EU oilseeds market. Under the Agreement, EU oilseed plantings (rapeseed, sunflower and soybeans) for food purposes are limited to a maximum guaranteed area (MGA) of 4.93 mn ha for producers benefiting from crop specific oilseeds payments. Blair House also requires a set-aside of at least 10% and limits the production of industrial/non-food use oilseeds on set-aside area. Output from oilseeds planted on set-aside land for industrial purposes is limited to 1 mn t soybean meal equivalent annually. If there is an overshoot of the MGA, the EU is required to apply penalties (on a country-by-country basis) that reduce the next year’s final compensatory payments by an amount equal to the percentage of the area overshoot.

### 3.4. MBM ban

As widely predicted, the MBM ban has resulted in an increase in the use of soybean meal as the most efficient, in technical and economic terms, replacement for the protein previously supplied by MBM (total annual EU animal meal production of about 3 mn t includes about 2.5 mn t of MBM; it is estimated that 2 mn t are used as animal feed for domestic meat producing livestock). The main
impact of the MBM ban has thus been on soybeans, rather than on the other oilseeds. However, the increase in soybean meal usage has so far remained relatively limited due to the price competitiveness of domestically-grown feed grains such as wheat and barley. Additional increases in soybean meal use are however expected in future, both from direct imports and through crushing of imported soybeans.

On the basis of the nutritional value (ratio of protein to energy content) of the various raw materials used in animal feed the Commission has provided estimates of the likely impact of the ban, in terms of the additional land requirement in the EU-15 for the cultivation of the various vegetable proteins that can potentially replace the banned animal meals. It is estimated, for instance, that an additional 0.9 mn ha of soya would be necessary (compared to 0.4 mn ha currently cultivated), if soya meals were to completely replace totally the animal meals currently used, but only an additional 1.9 mn ha of cereals (compared to 37.4 mn ha currently) (Table 2). Soya and cereals are indeed the two vegetable proteins that are most readily available (in the world and in the domestic markets respectively) substitute to animal proteins.

Table 2  Additional land use needed for the cultivation of vegetable proteins for use in animal feed, following the MBM ban in the EU-15*

<table>
<thead>
<tr>
<th>Land use (EU-15)</th>
<th>Additional land* (mn ha)</th>
<th>Current land (mn ha)</th>
<th>Increase (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybeans</td>
<td>0.9</td>
<td>0.4</td>
<td>217%</td>
</tr>
<tr>
<td>Rapeseed</td>
<td>2.0</td>
<td>3.1</td>
<td>66%</td>
</tr>
<tr>
<td>Sunflower seed</td>
<td>4.2</td>
<td>2.0</td>
<td>210%</td>
</tr>
<tr>
<td>Pulses</td>
<td>1.1</td>
<td>1.2</td>
<td>92%</td>
</tr>
<tr>
<td>Cereals</td>
<td>1.9</td>
<td>37.4</td>
<td>5%</td>
</tr>
<tr>
<td>Dried forage</td>
<td>1.0</td>
<td>0.7</td>
<td>140%</td>
</tr>
<tr>
<td>Green forage</td>
<td>1.3</td>
<td>70.0</td>
<td>2%</td>
</tr>
</tbody>
</table>

* Additional land required if each of these vegetable protein sources was to replace totally animal meals, on the basis of contributing an equivalent nutritional value in terms of protein content, but without taking into account the amino acid composition of the different protein sources.

Source: EC Commission (DG AGRI)

These estimates do not take into account technical factors such as the amino acid composition and technical efficiency of the different proteins or the specific requirements of the various animal feeds, or economic factors such as relative prices between the different protein sources or their availability or indeed the impact on animal feed consumption from the dynamic evolution of the demand and

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supply of meat. Following, for instance, the BSE crisis demand for pigmeat and poultry has increased at the expense of beef and this has implications for feed use⁴.

Relative prices are an important factor in the choice of the protein mix by the animal feed industry. According to the Commission services, if the price ratio between soya meals and cereals is lower than 1.5, the animal feed and the livestock industry prefer to use protein rich ingredients (oilseed meals) rather than cereals. This situation was prevalent before the 1992 CAP reforms, as well as in 1994/95 and in 1998/99. On the other hand, if the relative price ratio higher than 1.5, then the use of cereals is favoured. This is the situation that prevailed in 1996/97 and since the autumn of 2000.

4. Agronomic analysis

4.1. Overview

This analysis reviews the different possible sources of vegetable protein, analyses their characteristics in terms of value for livestock feeding (i.e. protein content, meeting essential amino acid requirements, metabolic energy etc.), and examines whether there is scope in terms of the agronomic viability of expanding vegetable protein production in the EU.

Currently, for a mixture of agronomic and economic reasons, which are explored in more detail below, the main EU areas for non-grain vegetable protein production are the southern EU Member States and France (in a line approximately up to the Loire Valley) for production of sunflowerseed and soybeans. Lucerne (alfalfa) is also particularly attractive in these regions. The northern Member States (including France north of the Loire) are particularly suited for production of rapeseed and pulses. For rapeseed the most northern regions (e.g. northern England, Scotland, Sweden) will tend to use spring sown varieties.

4.2. Sources of vegetable protein and nutritional properties

The protein supply chain is complex and is closely linked with the production of combinable break crops, forage maize, intensively managed lowland ryegrass meadows, grass-clover and alpine pastures which provide grazing and conserved products.

**Pulses** (peas and beans), as distinct from oilseeds, are legumes which are planted and harvested primarily for their mature or immature (vegetable) seeds. They are an important source of dietary protein and carbohydrates (rarely oil), and are consumed whole by humans, or incorporated after

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⁴ The Commission estimates that as a result of the BSE crisis (and its impact on demand for meat), overall demand for feed will increase and this will be mainly covered by domestic cereals (an extra 4 mn t in 2000/01) and imported soya meals (1-1.5 mn t).
grinding into livestock diets. For most pulses the crude protein content is in the range 25-31% (Table 3).

**Table 3** Typical composition of grain legume seeds (% Dry Matter (DM))

<table>
<thead>
<tr>
<th></th>
<th>Crude protein*</th>
<th>Oil</th>
<th>Crude fibre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peas</td>
<td>25.0</td>
<td>1.5</td>
<td>7.0</td>
</tr>
<tr>
<td>Winter faba beans</td>
<td>26.5</td>
<td>1.5</td>
<td>9.0</td>
</tr>
<tr>
<td>Spring faba beans</td>
<td>31.4</td>
<td>1.5</td>
<td>8.0</td>
</tr>
<tr>
<td><em>Lupinus albus</em></td>
<td>34-45</td>
<td>10-15</td>
<td>3-10</td>
</tr>
<tr>
<td><em>Lupinus angustifolius</em></td>
<td>28-38</td>
<td>13-23</td>
<td>6</td>
</tr>
<tr>
<td><em>Lupinus metabolis</em></td>
<td>32-46</td>
<td>13-23</td>
<td>8</td>
</tr>
<tr>
<td>Soyabeanes</td>
<td>37</td>
<td>17</td>
<td>12.8</td>
</tr>
</tbody>
</table>

Notes: Most grain legumes used as a source of protein contain sub-optimal levels of the sulphur amino acids methionine and cysteine. This deficiency is easily offset by the inclusion of cereals in livestock rations. Tannins in faba and soyabeanes and toxic alkaloids in lupins are also a concern to nutritionists and feed compounders, although tannin-reduced (white flowered) faba beans have now been developed by plant breeders. The Table emphasises the future potential of lupins in the EU as a source of protein and oil; this species is still being studied as a suitable crop by agronomists and breeders.

**Oilseed cakes** are a by-product following oil extraction from a range of annual oilseeds (soya bean, sunflower, oilseed rape, cotton and groundnut), as well as tree fruits (coconut, olives and oilpalm). For most annual oilseed cakes the protein content ranges from 38-55% (Table 4). It is important to note the advantages of the **soya bean** over pulses (Table 3) and other oilseed crops (Table 4). This is rich in protein and oil, easy to grow and harvest and therefore, understandably, the world's most important source of vegetable oil and livestock protein.

**Table 4** Typical composition of oilseed protein cakes (% DM)

<table>
<thead>
<tr>
<th></th>
<th>Crude protein</th>
<th>Fibre</th>
<th>Oil</th>
<th>Starch &amp; sugars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton</td>
<td>41.0</td>
<td>15.9</td>
<td>1.7</td>
<td>9.0</td>
</tr>
<tr>
<td>Groundnuts</td>
<td>52.0</td>
<td>9.0</td>
<td>6.5</td>
<td>14.0</td>
</tr>
<tr>
<td>Soyabean (hipro)</td>
<td>55.0</td>
<td>4.0</td>
<td>2.4</td>
<td>16.0</td>
</tr>
<tr>
<td>Oilseed rape</td>
<td>38.5</td>
<td>11.0</td>
<td>3.2</td>
<td>14.5</td>
</tr>
<tr>
<td>Sunflower (hipro)</td>
<td>45.0</td>
<td>16.0</td>
<td>2.5</td>
<td>12.5</td>
</tr>
<tr>
<td>Palm kernel meal</td>
<td>18.0</td>
<td>17.5</td>
<td>8.3</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Notes: **Soya meal** is the best quality vegetable protein source and is widely traded throughout the world. *Hipro* soya does not have the hulls (outer seed coat) and is lower in fibre than *lopro* soya meals (8.2%). It is high in protein.
and energy, has a good overall amino acid profile and is high in lysine. It is a good source of phosphorus and vitamins B and D.

**Cotton meal** is inferior in quality to soya meal, because it is higher in fibre and has a poorer amino acid profile. Anti-nutritional factors, such as aflatoxins and gossypol, can produce digestive and palatability problems, especially in monogastrics, and adversely affect protein digestibility.

**Groundnut meal** can prove a major concern in terms of fungal attack while the nuts are ‘curing’ (drying) in the field - aflatoxins caused by fungi growing on the seeds is common especially in tropical countries. It is deficient in vitamin B12.

**Rapeseed meal** has been an EU soya meal replacement since the 1970s, although the protein is less digestible. Recent ‘double zero’ varieties are lower in glucosinolates (mustard compounds) which decrease palatability.

**Sunflower meal (hipro)** is ideal for ruminant rations, because it is richer in the sulphur amino acids, although lower in lysine than soya.

**Grassland and forage.** About half of the EU farmland is grassland pasture or hay meadow, and in all its diverse forms this is the renewable protein foundation feed of the EU livestock industry. The grass and legume families provide a wide range of species and conserved products which are rich in protein (Table 5).

<table>
<thead>
<tr>
<th>Table 5</th>
<th>Typical composition of grass and legume forage crops (% DM)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crude protein</td>
</tr>
<tr>
<td>Fresh grass</td>
<td>16-20</td>
</tr>
<tr>
<td>Grass hay</td>
<td>10.4</td>
</tr>
<tr>
<td>Grass silage</td>
<td>13.0</td>
</tr>
<tr>
<td>Maize silage</td>
<td>9.0</td>
</tr>
<tr>
<td>Dried lucerne</td>
<td>18.0</td>
</tr>
<tr>
<td>Lucerne silage</td>
<td>19.5</td>
</tr>
</tbody>
</table>

*Note:* In temperate areas of the EU rotational meadows are mainly sown with perennial and Italian ryegrasses, and frequently include white and red clover varieties as a source of nitrogen and minerals. There are a large number of varieties suitable for grazing, conservation and protein production.

In EU countries such as the Netherlands and the UK recognition that fertiliser N was the most important nutrient limiting grassland production led to increasing rates of application and intensification of stocking. Other sources of N such as organic manures and biological N from protein rich legumes such as white and red clover and lucerne became completely subsidiary to inorganic nitrogen.

In many regions of Europe, some system studies have demonstrated the agronomic sustainability and economic viability of production systems with different animal species based on grass/white clover
mixtures rather than heavily N fertilised meadows (i.e dependent on grass alone). However, the uptake of forage legumes into pasture seeds mixtures has been slow, except in some former E. European countries, where fertiliser N was priced out of the market. Nevertheless there are now increasing environmental pressures in the EU to reduce the excessive use of inorganic fertilisers for grazing and conservation due to increased public awareness of their contribution to the contamination of underground and surface waters. Increasingly, therefore, the floral and faunal diversity of grassland is being supported by a range of financial incentives from EU governments. However, in spite of this areas of important protein forage crops such as red clover, lucerne and minor legumes (trefoil vetch and sainfoin) are actually in decline.

In must be emphasised that the perennial quality advantages of grass and forage legumes need to be maximised in temperate northern European regions where annual arable cropping on many marginal soils (heavy clays, light chalk soils) has now become less profitable due to the policy changes resulting from Agenda 2000.

4.3. Assessment of suitability for use in animal feed

A broad classification of the protein content of vegetable proteins used in animal feed and their degree of equivalence to non-vegetable sources is given in Table 6. Not only is the protein intensity important, but also the protein composition in terms of essential amino acids (such as lysine, methionine and threonine). Soya meal has almost the same protein intensity as animal meals and a comparable composition in amino acids. Other oilseed cakes (rapeseed, sunflower) and protein crops have both a lower protein intensity and a less efficient protein composition which necessitates the use of synthetic amino acid supplements in the animal feed. Cereal-based proteins are the least protein-rich and least efficient of all vegetable proteins.

<table>
<thead>
<tr>
<th>Protein-intensity</th>
<th>Vegetable proteins</th>
<th>Non-vegetable proteins</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Soya meals/cakes (48-50%)</td>
<td>Fish meal (60%) Animal meals (55%)</td>
</tr>
<tr>
<td>Medium</td>
<td>Rapeseed meals/cakes (32%) Sunflower meals/cakes (28%) Feed peas &amp; other pulses (23%) Corn gluten (22%)</td>
<td>SMP (35%)</td>
</tr>
<tr>
<td>Low</td>
<td>Dried forage (15-20%) Cereals (9-12%) Manioc (&lt;2%)</td>
<td></td>
</tr>
</tbody>
</table>

The digestibility of the various proteins by the different animal species is another important factor determining the suitability of the various protein sources of animal feed. As a general rule, ruminants
are less demanding in terms of protein quality and digestibility and present fewer constraints in terms of the need for protein composition in amino acids (to the extent that they can rely extensively on dried forage for instance). Similarly, bovines and other grass-fed animals can rely extensively on forage feed and other ‘non-tradable’ raw materials such as grass, silage etc., which limits their dependence on oilseed/cereal protein sources. On the other hand, the possibility to diversify protein feed sources is more limited in the case of the more demanding monogastrics, i.e. pigs and particularly poultry. In this case, soya meal is the most appropriate and widespread vegetable protein used because it presents the least constraints in technical terms of all vegetable proteins used in animal feed.

4.4. Agronomic assessment of production potential

Production of proteins in the EU could be raised by increasing the area of arable land devoted to pulse and oilseed crops. In agronomic terms, this idea seems attractive because leguminous crops are capable of fixing their own nitrogen, and their production generally incurs lower variable costs than cereals and roots. Oilseed and protein pulses are also ideal ‘break’ crops because they do not carry the common pests and diseases which infect small grain crops belonging to the grass family, while they also offer several other technical advantages. As a combinable crop, soya uses the same machinery employed for cereal production, and as a grain legume (pulse) it is capable of fixing its own nitrogen requirement.

However, several factors undermine the potential effect that the increase in cropping area would have on the production output of proteins, as follows:

1. Pulses and oilseed rape should only be produced in strict rotation approximately every 4th or 5th year. This is to control the build up of soil borne pathogens such as *Sclerotinia sclerotiorum*, eelworms and damping off diseases (*pythium* and *fusarium*). Any effort to increase the frequency of rotation would therefore be likely to increase the incidence of disease and require substantial additional agrochemical inputs to control such an increase.

2. **Pulse crops** (peas and beans) continue to lack yield stability and suffer altogether from lower yields when compared to cereals. Although the introduction of an EU subsidy scheme in 1978 to encourage home grown proteins for animal feed resulted in varietal improvements (especially the introduction of semi leafless white seeded stock peas), which increased yields and improved harvesting systems (e.g. since 1980, for example, the UK national average yields of field beans and peas have been increased by approximately 23%), the problem persists. Similarly, the yields of field beans vary widely from season to season throughout N. Europe due to the disease chocolate spot (*Botrytis fabae*). In southern Europe the growing of such temperate zone crops would not be viable without irrigation which in turn makes these crops (for feed usage) uncompetitive.
In addition, the stability indices for peas and beans in northern Europe remain much higher (i.e. indicating higher instability) than wheat (Table 7), which means that in practice it is still difficult to provide reasonably accurate annual arable forecasts for legume seed production. Thus, the advantages of rotation, higher yields and spread of labour are mainly offset by the simple fact that it is still much easier to harvest a determinate crop (cereals) rather than an indeterminate crop which continues to flower and set pods throughout much of the growing season. Pulse crops (and oilseed rape) have an extended flowering period (4-5 weeks) and as a result there is a wide spread of maturity towards harvest. Seed losses (due to pod splitting) from indeterminate crops are much higher than from cereals, which ripen evenly in the field.

### Table 7 Stability index (% yield variability) for pulses and wheat in the UK*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vicia faba beans</td>
<td>170</td>
<td>95</td>
</tr>
<tr>
<td>Peas</td>
<td>98</td>
<td>100</td>
</tr>
<tr>
<td>Wheat</td>
<td>67</td>
<td>60</td>
</tr>
</tbody>
</table>

*Note* A high stability index shows poor yield stability. Index calculated as follows:

\[
\text{Stability index} = \left(\frac{\text{annual deviation in yield from 5 year mean} \times 100}{\text{5 year mean yield}}\right)^2
\]

*Results would be similar across northern Europe

3. Related to the above factor, the **financial instability of the production of pulses (and certain oilseeds)** means that arable farmers in the EU need a sufficiently attractive premium if they are to switch to these crops, and will always adjust their cropping rotation in relation to the level of subsidy available as well as the world market price. For instance, in the UK, areas of linseed (another source of protein meal) rose quickly when the Arable Area Payment Scheme (AAPS) reached £500/ha in the mid-1990s, and then declined when the Agenda 2000 proposals were implemented. Similarly, the 2002 premium for pulses is only expected to at best sustain the present area of pulses on EU farms, and is unlikely to cause a significant impact for 2002/03.

4. In the case of **soya**, the **current varietal availability** has been an obstacle to the expansion of the production of this crop in the EU. Early attempts to introduce this crop into N. Europe were unsuccessful since the tested N. American varieties were found to be too sensitive to long days (photoperiod). Day length neutral, European bred varieties (such as Fiskeby V from Sweden) had also been previously tested but had been shown to be of inferior commercial value due to variable protein content and late harvest.
The potential production of soyabean in southern regions of the UK and N. France is again being researched due to the acquisition of day neutral varieties from Belarus. In order to evaluate their suitability for commercial production under temperate conditions, the effects of sowing date and day length on crop development and yield have been investigated in a series of UK and French trials funded by United Oilseeds and the UK MAFF (now DEFRA). The results clearly demonstrate the importance of soil temperature on establishment, and confirm that varieties cannot be drilled until the first week of May (Table 8). These studies have also shown that the variety Yaselda is capable of producing plot seed yields equivalent to 4.8t/ha. The main problem with successful commercial production in N. Europe is field drying in the autumn. Seed moistures must fall below 20% for successful combining by the end of September, and wet autumn conditions during 1997-2000 meant that few trial sites were mechanically harvested. Growing soyabean in N. Europe remains under development and more trial and plant breeding work is urgently needed before we either dismiss or establish the suitability of the Russian soya varieties.

Table 8 The effect of sowing date (1997-99) on the number of calendar days from planting to 75% emergence and seed yields (14% mc)

<table>
<thead>
<tr>
<th>Sowing date</th>
<th>Soil temperature (°C) at 10cm</th>
<th>Days to 75% emergence</th>
<th>Plot seed yields (t/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 April</td>
<td>11.4</td>
<td>37.5</td>
<td>2.90</td>
</tr>
<tr>
<td>17 April</td>
<td>11.7</td>
<td>29.5</td>
<td>3.17</td>
</tr>
<tr>
<td>24 April</td>
<td>12.1</td>
<td>22.3</td>
<td>3.85</td>
</tr>
<tr>
<td>1 May</td>
<td>13.0</td>
<td>18.3</td>
<td>4.22</td>
</tr>
<tr>
<td>8 May</td>
<td>13.5</td>
<td>14.0</td>
<td>4.70</td>
</tr>
<tr>
<td>15 May</td>
<td>14.9</td>
<td>12.0</td>
<td>4.75</td>
</tr>
<tr>
<td>22 May</td>
<td>16.1</td>
<td>11.0</td>
<td>4.78</td>
</tr>
</tbody>
</table>

Note. Variety Yaselda. Seed was inoculated with Rhizobium bacteria before drilling. Yields were estimated using plot sampling techniques.


4.5. Conclusions

The agronomic analysis suggests that financial incentives, rather than agronomic advantages, appear to be the most important factor driving EU farmers’ production decisions with respect to vegetable protein production. Due to the continuing substantial agronomic difficulties in the production of pulse crops and oilseed crops, EU farmers would need substantial financial incentives to switch production from cereals to these crops, despite their obvious benefits in terms of suitability in feed use.
Up to Agenda 2000, the increased production of rapeseed and sunflower oilseed protein cakes in the EU was mainly influenced by CAP subsidies rather than the crops’ rotational advantages. This was despite the fact that farmers have had considerable difficulty dealing with the related bureaucracy (e.g. in understanding and calculating arable area payments, working out compensations for over/undershooting production and arable base areas), whilst the support programmes for the two major oilseeds changed so often that farmers’ confidence in the profitability of protein cake production was continuously undermined).

After Agenda 2000, the most contentious policy measure in relation to future protein cake supplies is the alignment in payment for all small grain and oilseed crops. Clearly, the reduction in support for oilseeds has further lessened their attraction when compared to higher and stable yielding cereal crops. In the UK, for instance, growers have scrutinised their variable and fixed costs for rapeseed and have now reached the point where the crop may soon only be grown in case of rotational advantages (first wheat following the oilseed break shows a yield increase of around 10%). In this situation, the area may stabilise or even decline in N. Europe (unless profitability is increased as a result of the introduction of hybrid and possibly genetically modified varieties).

The analysis also suggests that the use of grass and legume forage crops remains largely unexplored, although potentially promising. A classification of grain legumes is provided in Figure 6.

In the UK, the role of grassland and forage legumes has been explored in long term rotational studies at the Rothamsted Experimental Station and by the former Grassland Research Institute at Hurley. It appears that scientific papers on protein production from forage exist in most member states but that much of this knowledge has still to be tested in practice. Moreover, in the rush to return to more sustainable and environmentally friendly production systems, there is a risk of funding repetitive research before carrying out an historical analysis using data already available.

There is already a vast EU literature on lucerne, sainfoin, clovers and the effects of pasture management on N fixation and protein production from grazing and conserved products. The practical implications of this work have not been greatly affected by varietal change, so these are still valid and useful.

Phaseolus beans (P. vulgaris - common bean or navy bean) are a valuable source of human protein and widely used as a vegetable in the EU. This crop has never received area support, although many varieties have now been bred for conditions in N. Europe. It is an ideal protein (pulse) break crop. Additional agronomic and economic research in needed to further assess this heat sensitive species for EU farming.
The genus *Lupinus* (including *lupinus luteus*) offers great potential to supply protein and some vegetable oil to the EU. A lot of research has already been carried out in the UK and France. These studies need coordinating especially in relation to anti nutritional substances and soil conditions. By contrast the genus *Lathyrus* (e.g. *Lathyrus sativa*, *Lathyrus cicera*), specifically mentioned in the EP Agriculture and Rural Development Committee Resolution on the Commission Communication on Options to promote the cultivation of plant proteins in the EU ((COM 2001) 148/2), cannot be seen as a reliable source of seed because seed output from such crops is wholly unpredictable and cropping is difficult. Such crops can at best be seen as a supplement to current feeds and not as potential replacements for the main feed crops.

Finally, it is important to **classify suitable regions within EU countries** (using soil type, rainfall and temperature data) in order to make the best use of research funds and avoid testing marginal protein crops. For example, it is pointless to ponder the agronomy of sunflowers in Cambridgeshire and navy beans in Kent (UK) when vast potential arable areas with a Mediterranean climate are available in southern EU-15 and candidate countries. Similarly, suitable growing sites for heat sensitive protein crops such as navy beans, lentils, soya and some lupin cultivars should be defined (mapped) using Ontario heat units; this system was successfully used to designate growing sites for forage maize (an important protein: energy silage) throughout N. Europe, and possible sites for grain maize in N. France.
Figure 6  Classification of EU and some commonly imported grain legumes (pulses)

**FAMILY**  
Leguminosae

**GENUS**
- Vicia
- Phaseolus
- Pisum

**SPECIES**
- faba (field beans)
- vulgaris (baked beans)
- lunatus
- sativum (peas)

**PRODUCE**
- Broad beans, harvested immature for immediate cooking, canning and freezing
- Field and tic beans, harvested mature mainly for livestock and pigeon feed
- Dwarf French ‘common’ or ‘snap’ beans, stringless pods harvested immature for immediate cooking, freezing and canning
- White seeded haricot or ‘navy’ (baked) beans. Imported mainly from USA. A wide range of seed types (colour and size) are sold in the EU
- Lima (large white seeded) and Sieva (small seeded) ‘butter’ or Madagascar beans for human consumption
- Spring sown, harvested dry for compounding or canning (processed peas), or immature (vining peas) for freezing and canning (garden peas). Winter varieties now being tested
5. Legal analysis

5.1. Overview

The analysis of the legal issues surrounding the expansion of protein crops reviews the legal constraints currently applying to an expansion of vegetable protein production in the EU. The key constraints here are:

- the area and volume ceilings imposed by the 1992 US/EU Oilseed GATT Panel or Blair House Agreement, i.e. the ceiling on EU-15 oilseed areas (5.482 mn hectares less a minimum 10% set aside) and the ceiling on by-product output for feed or food from oilseeds grown on set-aside land (1 mn tonne soymeal equivalent);
- in addition, output is affected by the Agenda 2000 decision to align area payment rates for oilseeds to those of cereals, an issue we have covered in the economic analysis. However, it is this alignment that is interpreted by the Commission as a sufficient condition for freeing up the EU oilseeds area and volume from the Blair House ceilings.

Thus the legal analysis concentrates on the issue of the future applicability of the Blair House agreement. It reviews whether there is room for manoeuvre to adjust the support mechanisms for oilseeds to encourage production further, e.g. by reviewing the direct payment rates for cereals, oilseeds and protein crops so as to provide greater encouragement to vegetable protein production. In this context, the analysis aims to establish whether the Commission’s claim that aligning all direct payments for cereal, oilseed and protein crops ensures that they are viewed as ‘decoupled’ and hence suitable for reclassification as non trade-distorting in the context of the ongoing agricultural trade negotiations in the current WTO Round is legally justified.

The legal analysis first presents the historical background of the US/EC oilseeds dispute which led to the adoption of the Memorandum of Understanding on Oilseeds (hereinafter Memorandum on Oilseeds), which is part of the Blair House Agreement. The Memorandum on Oilseeds imposes a limitation on the areas which can be planted with oilseeds subsidised at a higher level than other arable crops (i.e. cereals).

The rules relating to oilseeds production are consequently described. It appears accepted in the WTO that the EU rules comply with the Memorandum on Oilseeds, as inscribed in the Community GATT Article II Country Schedule (Part IV).

The analysis continues with an examination of whether or not the Memorandum on Oilseeds is still binding on the EU in light of recent market developments and the Agenda 2000 reforms. In the event that the area limitations in the Memorandum on Oilseeds are no longer binding, the implications for
oilseeds production subsidies are examined. If the limits in the Memorandum on Oilseeds are still enforceable, alternative actions to increase production are suggested.

5.2. Historical background of the US-EC oilseeds dispute

In 1961, the EC and the US agreed to reciprocal tariff concessions for whole, crushed, or broken soybeans, rapeseed and sunflower seeds, and oilcakes (all collectively known as oilseeds). The EC granted a “zero-duty-binding” for oilseeds. Consequently, US exports of oilseeds could enter the Community duty free. Indeed at that time, the EC oilseeds market was characterised by limited domestic production and high demand. Europe needed protein feed components for its rapidly expanding meat sector, and the US, the world’s largest producer of such products, was the EC’s principal supplier of oilseeds and oilseed products.

However, by 1966 the EC adopted a mechanism of minimum price reference and price subsidisation system for Community oilseeds processors in order to bring the oilseeds sector under the CAP and to stimulate domestic production. This regime provoked a sharp increase in EC production, which nearly tripled between 1980 and 1990. During this period, the volume of US soybeans imports fell by around 50%. The US soybean industry put pressure on the US Government to take action against the EC subsidisation regime.

In 1987, the US Government requested GATT consultations with the EC, but no settlement was reached. The US requested the establishment of a GATT Panel in order to examine the matter. In 1989 the Panel submitted its Report, finding that the EC practices were inconsistent with GATT and “benefits accruing to the US under Article II of the GATT were impaired as a result of subsidy schemes.”

The EC responded to this finding by enacting Council Regulation 3766/91 modifying the support system for producers of soya beans, rape, colza and sunflower seeds. The US reacted negatively to these reforms, claiming that the measures continued to contravene the EC obligations under the GATT, and decided to seek the reconvening of the original GATT Panel.

The Panel found that the new regime adopted by the EC did not violate Article III:4 of the GATT, but agreed that the benefits reasonably expected by the US under the tariff concessions continued to be impaired. The Panel called for the EC to “act expeditiously to eliminate the impairment” by either

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modifying its oilseeds support system or renegotiating EC tariff concessions for oilseeds under Article XXVIII of the GATT.

The EC sought to renegotiate its previously agreed tariff concessions and to compensate all injured US and third party industries, as provided for under GATT Article XXVIII:4. But the US, concerned that its export opportunities would be reduced, announced in November 1992 that it would impose 200% punitive tariffs on $300 million worth of white wines, wheat gluten and rapeseed oil exported by the EC to the US.

This dispute was finally resolved when the US and the EC signed a bilateral agreement on 21 November 1992. The Blair House Agreement contained a separate “Memorandum of Understanding on Oilseeds”, whereby the EC accepted certain limitations in relation to oilseeds.

The key elements of the Memorandum on Oilseeds included:

- The EC agreed to reduce the size of land used for planting oilseeds at the higher subsidisation level (an average of 5.128 million hectares, representing the average acreage dedicated to oilseeds between 1989 and 1991) by 10% over three years;

- For every percentage point of area planted in excess of the EC oilseeds area and benefiting from crop-specific oilseeds payments, the compensatory payments would be reduced by way of penalty;

- Direct compensatory payments to EC farmers were allowed in order to offset a loss of income resulting from price reductions;

- Oilseeds grown for non-food (industrial) purposes were exempted from the maximum area limits, but the output was not to exceed 1 million tons annually;

In summary, the EC agreed to limit the level of subsidised oilseeds production to the given 5.128 million hectares base area and in exchange the US withdrew its threat to impose additional duties on EC goods as a means of retaliation.

The Memorandum on Oilseeds also provided that if the membership of the EC were to be expanded, the maximum base area for subsidised oil seed plantations would be increased on the basis of the three last harvesting years in the acceding country.

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9 This Report was first considered by the General Council of the GATT Contracting Parties at its meeting on 30 April 1992. At its meeting on 19 June, the GATT Council, without adopting the Report, authorised the Community to enter into negotiations under Article XXVIII:4 for modification of tariff concessions with respect to certain relevant tariff positions.
In 1996, the Memorandum on Oilseeds ceiling was accordingly amended as three new members (Austria, Finland and Sweden) joined the EC. The increase of this limit was calculated on the basis of the three last harvesting years and resulted in the addition of 354,000 hectares to the original ceiling\textsuperscript{10}. The amended ceiling is 5.482\,mn hectares.

Thus the effect of the Memorandum on Oilseeds was largely to freeze the level of oilseeds production to the 1992-1994 levels. From 1997/98 to 2000/01, the adjusted maximum guaranteed area (MGA) for producers benefiting from crop specific oilseeds payments totalled 4.9338\,mn hectares (i.e., 5.482\,mn hectares minus 10\%).

5.3. The EU oilseeds regime and the Memorandum on Oilseeds

Support for oilseeds production is not counted towards the total EU AMS limit because the regime (Council Regulation 1765/92 following the 1992 Mac Sharry reform, as amended by Council Regulation 1251/1999 following Agenda 2000) falls into the exempted “blue box” category of domestic support. This classification occurs as long as the EU oilseeds support is tied to production limitations based on fixed areas and yields.

Under a simplified scheme, introduced by Regulation 1765/92, small producers of arable crops could apply for compensatory payments for areas of production no bigger than the equivalent of 92 tonnes of cereals if they achieved the average yield predetermined for that region. Under this scheme, no set-asides were imposed and the compensatory payment was paid at the rate applicable to cereals for all areas sown with arable crops. Thus, oilseeds grown under the simplified part of the arable area payments scheme\textsuperscript{11} have already been exempt from these restrictions by virtue of the fact that they could receive payments at the cereals level.

In practice, that meant that small farmers could devote the entire area to production of oilseeds (up to the limit set for the simplified payment scheme to apply), but were only compensated at the lower cereals level (i.e. if compared to the higher level provided to oilseeds). That production could (and did for those farmers that decided to grow oilseeds) occur outside the area limitation imposed by the Memorandum on Oilseeds\textsuperscript{12}.

\textsuperscript{10} Further accessions to the EC are covered by the Memorandum on Oilseeds, Annex to Part IV Section 1 in EC Schedule of Commitments: “It is understood that, should the membership of the EC be expanded, this agreement will be amended to reflect an increase in the separate base area in an amount to no more than the average level of production area of the acceding member in the three years immediately preceding such accession.”

\textsuperscript{11} This simplified payments scheme, instituted in 1992, allows for non-crop specific payment of a lower subsidy for commodities that do not have a set-aside obligation (Article 8 of Council Regulation 1765/92 of 30 June 1992 establishing a support system for producers of certain arable crops).

\textsuperscript{12} It appears that this occurrence and legal provision were never contested or challenged by the US and therefore considered in line with the spirit and scope of the Memorandum on Oilseeds.
In pursuing the implementation of the policies set out in the Agenda 2000 (Regulation 1251/1999), the Commission has progressively aligned the amount of subsidy granted to oilseeds to the amount granted to cereals, bringing down oilseeds aid from €92.24/ton to €63/ton by 2003, equivalent to the amount of aid granted to cereals.

The equalisation of the payments for both cereals and oilseeds is intended to do away with the specificity of oilseeds payments. The production limits in the Memorandum on Oilseeds are linked to the “specific” nature of the oilseeds subsidies. This is clearly stated in Article 2 of the Memorandum, where it explicitly refers to the benefits accruing to EC producers in respect of crop-specific oilseeds payments. Had oilseeds benefited only from the level of support granted to arable crops in general, the Blair House Agreement would most likely not have resulted in the adoption of the Memorandum allowing for crop-specific support at the higher level of subsidy.

This consideration is central to the interpretation of the issue at stake. There is a clear link between the specificity of the payments (i.e., a specific higher payment for oilseeds) and the area limitation. If there were no specificity, there would be no limitation.

In its Mid-term Review Proposals\(^\text{13}\), the Commission expects an increase in demand for vegetable oils. However, given the decrease in the levels of oilseeds subsidisation, there might be a contraction in EU oilseeds production. At the same time however, following the 2001 ban of meat and bone-meals, net imports of oil meals and oilseeds in the EU have increased from around 32 mn tons in 1999 to 36 mn tons in 2001. This increase concerns almost exclusively imports of soybeans and soya-meal, which are substitutes to meat and bone meal.

**5.4. Legal assessment**

This section examines:

1. The validity of the Memorandum on Oilseeds.
2. The implications for oilseeds production subsidisation, should the Memorandum on Oilseeds be no longer applicable.
3. The risk of action by the US.
4. Alternative solutions to allow for an increase in oilseeds production, should the Memorandum on Oilseeds be considered still applicable.

5.4.1. The applicability of the Memorandum on Oilseeds

This issue is examined with regards to a number of parameters, as follows:

a) Duration

There are no limitations on the duration of the Memorandum on Oilseeds resulting from the provisions of the Understanding. Therefore, the Memorandum on Oilseeds appears to be still in force.

b) Applicability

The Blair House Agreement is annexed to Schedule LXXX of the Agreement on Agriculture (Annex to Section I of Part IV) concerning the commitments to limit subsidisation.

The US argues that the Memorandum on Oilseeds has been incorporated into the EC WTO schedule of concessions. This implies that it is not a simple bilateral agreement, but a multilateral commitment, to which the EC will continue to be bound, unless it renegotiates the Memorandum on Oilseeds with all interested parties.

Although the US argument may sound legally correct, the rationale behind the Memorandum on Oilseeds was clearly to limit the amount of EC production that could benefit from the high level of crop-specific payments. This subsidy has consistently been set at a much higher level than that granted to cereals. Such a difference in the level of subsidisation confers specificity to the level of support provided for oilseeds production and has to be considered as the justification for the Memorandum on Oilseeds subsidised area restriction.

There is much debate around the consequences for the Memorandum on Oilseeds when specific oilseeds payments are aligned with the level of aid generally accorded to arable crops. Indeed, if oilseeds subsidies lose their specificity, restrictions on production levels can no longer be justified. On the basis of this consideration, it can be argued that, in such a case, the Memorandum on Oilseeds would no longer be applicable.

From a legal perspective, two are the issues at stake here. One is the validity of the Memorandum on Oilseeds, the other is its applicability. They should not be confused:

- We consider the Memorandum on Oilseeds legally valid. It has not lapsed and the parties have not agreed to repeal it.
As for its applicability, we regard it still applicable in as much as the EC could decide to support EC oilseeds production at a level higher than the one provided in a non-crop-specific way to cereals (namely, €63/t).

On the other hand, the elimination of crop-specificity payments for oilseeds and the alignment of the level of support to the one generally granted to cereals renders the Memorandum on Oilseeds unnecessary and therefore inapplicable.

In practical terms, the Memorandum on Oilseeds remains legally valid and would be applicable should the EC decide to go back to a higher level of subsidisation for oilseeds. This reasoning is confirmed by the fact that, even during the applicability of the Memorandum on Oilseeds, the EC could support oilseeds (outside the restrictions of the Memorandum on Oilseeds) grown under the simplified part of the arable payment scheme. This was a consequence of the fact that such oilseeds production was supported at the level of cereals and was not crop-specific. The Memorandum on Oilseeds was valid and remained in force but still did not apply to that production.

5.4.2. Implications in case on non-applicability

The EC could not consider increasing the level of production support past the level granted to (and allowed for) arable crops (i.e., €63/t), because in such a case the subsidy would remain crop-specific in nature and the application of the Memorandum on Oilseeds area limitation would apply.

If the specific regime instituted by the Memorandum on Oilseeds is no longer applicable, subsidies for oilseeds production will fall under the general WTO rules on subsidies.

In this case, the EC has three options to classify its subsidies for oilseeds production in conformity with its obligations under the WTO Agreements, which are examined in turn:

- either the subsidies benefit from one of the two exemption provisions of the Agreement on Agriculture, i.e. the ‘blue-box’ or the ‘green-box’ exemption;
- or they are counted towards the Aggregate Measure of Support (AMS) of Article 6 and Annex 3 of the Agreement on Agriculture.

Any re-classification will have to be notified by the EC to the WTO and reviewed by the Committee on Agriculture.

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14 Supra, Part II on the simplified payment scheme.
15 Article 18.2 of the Agreement on Agriculture.
(a) The “Blue Box” exemption

Under WTO law, support measures are exempted from reduction commitments when they classify under the “blue box” category of domestic support.

Only domestic subsidies paid directly to farmers from governmental budgets and tied to production-limiting requirements qualify for the exemption. These direct payments must be based on either fixed acreage and yields or on 85% or less of the base level of production\(^\text{16}\).

The advantage of the “blue box” exemption is that it does not require the subsidy to be decoupled from the product\(^\text{17}\) up to a certain level of production. Under this category Governments can encourage their farmers to produce in order to be eligible for these exempted payments, and also make the size of payments directly dependent on the volume of production, so long as it is on no more than 85% of the production in the base period.

The lowering of the level of support to €63/t aligns oilseeds to cereals for purposes of the “blue box” subsidies which are payable by the EC. That level applies to all arable crops commodities, it is in line with the WTO commitments undertaken by the EC as for the overall subsidization destined to agricultural products\(^\text{18}\), and is consistent with the budgetary constraints resulting from the adoption of Agenda 2000.

Since 1992, in fact, arable crops have been eligible for a hectare-based EC aid scheme which is the result of a combination of two factors: intervention prices (which have been progressively decreasing) and various other aid schemes (which have progressively increased over time). As a result of Agenda 2000, this level is now at €63/t.

Along with the nature of production-limitation (through fixed areas and yields), the EC aid scheme for arable crops also includes “set-aside” measures for withdrawing land from cultivation. For the above reasons, these support mechanisms qualify under the “blue box” exemption and do not count towards the EC AMS calculation.

Furthermore, the alignment of the level of support for both oilseeds and cereals to the amount allowed under the “blue box” for arable crops will also result in the application of the same rules to both types of crops. They will also be subjected to one single production limitation, which will

\(^{16}\) Article 6.5 of the Agreement on Agriculture.

\(^{17}\) The Blair House Agreement does not require “decoupling” either, the rationale underlying the Agreement being the “specificity” of oilseeds payments.

\(^{18}\) It should be noted that Article 13 of the Agreement on Agriculture allows for the “peace clause” to apply in as much as the subsidies do not grant support to a specific commodity in excess of that decided during the 1992 marketing year. That reference level will provide the ultimate ceiling for the total level of support (i.e., AMS and “blue box”) allowed for each commodity. Otherwise these subsidies could be countervailable.
amount to the addition of the current Memorandum on Oilseeds’ ceiling (more or less 4.9 mn hectares) to the base area provided for all other arable crops\textsuperscript{19}.

The interesting feature of the “blue box” payments is that, although the total EC base area destined to subsidised production of arable crops is relatively inelastic\textsuperscript{20}, the allocation of subsidies within the total budget destined to arable crops is subject to market forces, price factors, farmers’ choices and other variables such as the cyclical nature of agricultural production.

In practical terms, this means that there is nothing in the law that would prevent the EC from increasing the extent of subsidisation of oilseeds production (within the “blue box” limits) as long as the level of support is equivalent to the one offered to the other arable crops. EC farmers would be fully entitled to increase the acreage destined to oilseeds production.

(b) The “Green Box” Exemption

We have been asked whether “green box” payments could provide an alternative way to foster oilseeds production in the EC. The fundamental requirement to qualify for a “green box” exemption is that any support should have no or only minimal trade-distortive effects or effects on production\textsuperscript{21}.

All measures under this exemption must fulfil the general criteria set out in paragraph 1 to Annex 2 of the Agreement on Agriculture. In particular, the support must be provided through a publicly funded government program, not involving a transfer from consumers and support may not have the effect of providing price support to producers.

Depending on the nature of the particular policy under consideration, the support measure must also fulfil policy-specific criteria. Annex 2 contains twelve categories of such “specific policy measures” with their own respective specific criteria and conditions.

With respect to oilseeds production, the relevant category is the one of “direct payments to producers” listed in paragraphs 6 to 13 of Annex 2. Since “green box” measures may not distort trade, payments have to be decoupled from production. In other words, the amount of such direct payments in any given year may not be related to the type or volume of production, price of products, or employment of certain factors of production.

Such subsidies can, for instance, be granted under environmental programmes designed to offset the extra costs incurred by the producer in his efforts to comply with specific conditions set by government environmental programmes.

\textsuperscript{19} See Annex III of Council Regulation 1251/1999 and Annex VI of Regulation 2316/1999 as amended by Regulation 1454/2000 for the total EC base area (to be obtained by adding together all Member States’ base areas).

\textsuperscript{20} The total amount might actually increase, but it is ultimately constrained by the provision of Article 13 of the Agreement on Agriculture in that the total subsidisation, calculated by adding the “blue box” payments to the AMS subsidies, cannot be greater than the level of support granted during the 1992 marketing year.
Part of the European Community’s CAP reform is to shift support for agriculture from the product to the producer. In the cereals and oilseeds sector, this is achieved through the reduction of support prices and the introduction of partially decoupled direct payments. The final aim of these reforms is to introduce “one single income payment per farm”, based on historical payments. The Commission believes that such payments can be secured within the WTO context thanks to their compatibility with the “green box”.

That might prove a valid legal argument and a viable approach, but “green box” subsidies do not seem to provide an immediate solution to the objective of achieving higher oilseeds production within the EC.

Indeed, since “green box” subsidies must be decoupled from production, payment of “green box” subsidies will not necessarily result in higher oilseeds production. Instead farmers are given complete farming flexibility under this scheme, their only obligation in return for the subsidy being to comply with the specified environmental, food safety and animal health and welfare standards.

The EC could also consider creating a new type of support mechanism under the “green box”. The following concept is debatable in terms of its WTO consistency, but it is a mechanism worth considering, especially at a time when the US is resorting to it to subsidise certain agricultural production.

In particular, a new form of “green box” subsidy could be modelled on the concept of “counter-cyclical payments” introduced by the US Farm Bill in 2002. This general instrument allows for greater subsidization under given circumstances to shield farmers from the consequences of low market prices.

The EC has already argued that, since such payments are paid in function of fluctuations in the price of different commodities with respect to target prices also specified by commodity, they are to be considered “product-specific” and therefore should not be exempted from the AMS calculation.

However, the debate is still open. The EC could switch its position and provide for additional means of support for certain sectors (i.e., oilseeds). In particular, such an instrument could be modelled around the issues of health and safety (instead of market price fluctuations like the US). The health and safety argument is one of the non-trade concerns that the EC has been promoting in the Doha agricultural negotiations. Therefore is would be consistent with the EC negotiating agenda and overall strategy.

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21 Paragraph 1 of Annex 2, Agreement on Agriculture.
In practice, this means that the EC could consider adopting a health and safety policy aimed at developing the production of a vegetable protein as an alternative to meat-based feedstuffs for livestock, which would be no longer allowed. Demand for vegetable proteins is rising by some 3% per year and the 2001 post-BSE crisis ban on usage of meat and bone meal for livestock would provide a solid “policy justification”.

A general instrument devised to respond to “cyclical” environmental and health scares would support the development of alternative safer food for livestock. Since soya-based foodstuffs are an adequate alternative to meat-based products, such an instrument would allow the EC to support the production of oilseeds, without creating an illegal crop-specific payment.

(c) Subsidies included in the Aggregate Measurement of Support

If a subsidy is not shown to benefit from one of the exemptions described above, it will be counted towards the WTO Member’s AMS limit\(^{22}\). The AMS is the annual level of support, expressed in monetary terms, indicating the size of annual transfers made for the benefit of agricultural products.

The AMS reduction commitments apply on the aggregate subsidisation for agricultural products rather than on a product-specific basis. AMS subsidies can either be product-specific support to the producers of the basic agricultural product or non-product-specific support to all agricultural producers in general.

The EC would not be in a position to foster oilseeds production by means of a greater use of subsidies that count towards its total level of AMS because in doing so it would conflict with the spirit and the scope of the Memorandum on Oilseeds. The potential EC AMS support of oilseeds production can be analysed depending on the actual level of subsidisation:

- In particular, should the EC provide product-specific AMS support to oilseeds at a higher level than the one provided to arable crops under “blue box” payments (i.e., €63/t), the Memorandum on Oilseeds would become once again applicable and its area limitations would be enforceable by the US. In a way, the EC is entitled (at least theoretically) to subsidise oilseeds production by means of AMS payments, but by doing so at a level above €63/t it would conflict with the provisions and area limitations of the Memorandum on Oilseeds.

- On the other hand, it would not make sense for the EC to support oilseeds production through AMS payments at a level equal or lower to €63/t, because it would be using its limited AMS resources to make payments that it could freely make through its “blue box” support.

\(^{22}\) Article 7.1 of the Agreement on Agriculture provides that WTO Members are under an obligation to ensure that all “green box” measures are maintained in conformity with the conditions set out under Annex 2. Any measure not shown to satisfy the conditions for exemption is required, under Article 7.2 of the Agreement, to be included in the calculation of the current total AMS for the year in question.
5.4.3. Risk of challenge by the United States

There is a risk that the United States make use of the provision in the Blair House Agreement stipulating that any dispute arising out of it will be subject to binding GATT arbitration.

- We believe that it would be difficult for the US to show impairment or nullification of its commercial rights as a result of the EC reduction of the level of support granted to oilseeds production (i.e. alignment to support for other arable crops).

Although the historical level of market access enjoyed by US oilseeds products on the EU market may be reduced should the EC production increase, that would simply be the result of a legitimate shift in EU farmers’ production decisions, and not of a deliberate barrier to imports from the US given the absence of tariffs and trade barriers (imports into the EU are duty free).

As long as the EC does not ‘couple’ the support granted to oilseeds production and as long as it does not exceed the limits provided by the Oilseeds Memorandum (i.e., the area allowed to be subsidised at a level higher than the one enjoyed by all other arable crops), the subsidisation of oilseeds production is in line with the WTO commitments undertaken by the EC.

In any event, the remedies available to WTO Members affected by the domestic subsidies of another Member depend on the type of domestic support in question.

“Blue box” measures are actionable, but under limited circumstances. A WTO Member has the possibility to resort either to unilateral countervailing duties or to claim nullification or impairment only if the exempted subsidies cause serious adverse effects to the domestic industry of that Member. On the other hand, “green box” subsidies are non-actionable (i.e., fully immune from challenge). In any event, the countervailability of EC oilseeds subsidies is a moot issue since EC exports of oilseeds are not the issue here.

5.4.4. Alternative actions in case of continuing applicability

Should the Memorandum on Oilseeds remain applicable, the EC would continue to be bound by its production ceiling. Yet, even in this scenario, other courses of action could be envisaged. The legal analysis concentrates, in particular, on two options:

(a) Production increase through EU enlargement

The EU could make use of the provision contained in the Memorandum on Oilseeds for increasing the production limitation in case of enlargement of its membership.
The Memorandum on Oilseeds annexed to the EC WTO schedule provides for the increase of the base area ceiling should the EU membership expand. This already occurred when Austria, Finland and Sweden joined the European Community.

Therefore, an alternative way to approach the problem (should the Memorandum on Oilseeds be considered still justifiable and therefore applicable) would be for the Commission to encourage the governments currently negotiating accession with the EU to increase their oilseeds production.

The increase in the EU base area for subsidised oilseeds production would be calculated, at the time of accession, on the basis of the average level of production area destined by the acceding country to oilseeds in the three years immediately preceding accession. Therefore, an increase during the three years leading to enlargement would allow a more important rise of the production ceiling provided by the Memorandum on Oilseeds.

One way to do that would be for the EU to consider subsidising CEEC oilseeds production through one of its programmes designed to support agriculture in accession countries (i.e., SAPARD).

It might not be as viable from a political and economic point of view, but it is an instrument worth considering, especially given the level of dependency on US exports that an enlarged EU would otherwise have and given the Commission’s predictions of substantial future increase in the demand for vegetable proteins.

(b) Programmes to increase productivity

As already stated, if the Memorandum on Oilseeds remains applicable, the EU would be constrained by the maximum base area for subsidised oilseeds production provided by the Blair House. However, the Memorandum on Oilseeds does not impose on the EU a maximum level of yield per hectare of oilseeds crops grown.

The EU could increase the yield of oilseeds production, as long as it does not exceed the maximum base area limitation and the limits placed on the production of oilseeds for industrial uses, by employing scientific and technological incentives designed to increase the yield of crops (e.g. through biotechnology). This productivity increase would occur in total conformity with the EU obligations under the Memorandum on Oilseeds.

In addition to the benefits of an increased productivity, subsidies granted to support scientific and technological progress may be exempted from the reduction commitments under the “green box”. In effect, WTO Members may offer support in relation to “programmes which provide services or benefits to agriculture or the rural community”\textsuperscript{23}. Such programmes include general research, research

\textsuperscript{23} See paragraph 2 of Annex 2, Agreement on Agriculture.
Therefore, the EU could increase oilseeds production through research programmes aimed at increasing the yield of oilseeds crops, in conformity with its WTO and Blair House obligations. Ultimately, in fact, this form of support would not result in the expansion of the fixed base area for oilseeds production. We only consider here the viability of this option in legal terms.

5.5. Conclusions

On the basis of the analysis conducted and the elements in our possession, the most viable and legally sound option for the EC would be to consider the Memorandum on Oilseeds as no longer applicable.

This approach would enable the EU to allow for, or even stimulate, an increase in oilseeds production by allocating to oilseeds a greater part of the resources available under the “blue box” subsidies for arable crops.

We believe that this would be in compliance with WTO law and in line with the EU obligations vis-à-vis the US and the other trading partners.

6. Economic analysis

6.1. Overview

The specific objectives of the economic analysis are as follows:

I. to assess the competitiveness of vegetable protein crops relative to other crops (i.e. cereals);
II. to explore policy scenarios that will stimulate vegetable protein production, but at the same time will comply with the legal framework that covers these crops; and,
III. to assess the impact of the proposed scenarios on protein production and on the CAP budget.

6.2. Competitiveness of vegetable protein production

A number of factors determine the economic competitiveness of the various crops and therefore production decisions and the choice of crop. These include agronomic and technical constraints (such as yields, and rotation requirements in order to maximise yields over time) and economic
considerations (product price, the cost of inputs, and the level of incentives such as direct area payments).

The relative competitiveness of the various vegetable protein sources, in terms of revenue, production costs and profit, as well as their technical performance in terms of yields is indicated in Figure 7 for the main EU Member States that produce these crops. As it can be seen, despite its consistently lower yields compared to cereals, the oilseeds sector has managed to secure some relatively competitive gross margins, both due to generally lower variable costs and higher direct area payments. The removal of the benefit of the area payment differential, as from 1 July 2002, is therefore widely expected to diminish the competitiveness of oilseeds vis-à-vis cereals.

Land use and the share of the different crops is an indication of the relative competitiveness of the various crops. If, over time, the relative share of the key competing crops in total EU-15 land use changes to a certain direction (e.g. favouring more land use on cereal crops), this suggests a relatively increasing competitiveness of cereals vis-à-vis oilseeds or protein crops. This indeed appears to have taken place in the course of last decade in the EU-15 (Figure 8). Due to the technical improvements that were also achieved during this time, the positive effect of the shift in land use on cereal production was even more marked than the increase in land use (Figure 9).

Policy-induced economic incentives such as area payments can have further effects on the relative competitiveness of the various crops, as clearly illustrated by the case of the 1992 CAP reform\(^\text{24}\). The introduction of oilseed area constraints under the 1992 Mac Sharry reforms, rather than the earlier applying production constraints, has led to an increase in the production of oilseeds due to a shift of the production towards higher-yield regions of the EU and therefore an increase in average EU-15 yields (some of the yield improvement is also due to technical progress as such). Thus, high yields countries like France, Germany, the UK and Italy have had a significant production increase at the expense of small producers such as Denmark, Sweden, Austria, Portugal, or low-yield producers such as Spain, despite the penalties incurred by the overshooting of the MGA certain years (1994/95, 1997/98 and 1998/99). There has also been a shift in production decisions between different crops, depending on their relative technical efficiency: sunflower production has fallen while rapeseed production has increased by 75% in the 1993-99 period (coming for the most part from France, but also Germany, Italy and the UK) (Figure 9).

Figure 7: Relative competitiveness of vegetable protein crops across key EU producing countries (2001)

France

* takes into account the costs of seed, fertiliser and plant protection products

Germany

* takes into account the costs of seed, fertiliser and plant protection products
Assessment of the Scope for the Development of Vegetable Protein Production in the EU

Final Report for the European Parliament

UK

![Graph showing area payments, variable costs, gross margin, and yield for different crops in the UK.]

* takes into account the costs of seed, fertiliser and plant protection products

Italy

![Graph showing area payments, variable costs, gross margin, and yield for different crops in Italy.]

* takes into account the costs of seed, fertiliser and plant protection products

Agra CEAS Consulting
Spain

Figure 8 Evolution of land use of key cereal, oilseed and protein crops, EU-15

Source: DG AGRI

* takes into account the costs of seed, fertiliser and plant protection products
Figure 9  Evolution of production of key cereal, oilseed and protein crops, EU-15

Cereals
Source: DG AGRI

Oilseeds and protein crops
Source: DG AGRI
6.3. Existing forecasts on EU vegetable protein supply

6.3.1. Current EU-15

According to DG AGRI forecasts\(^{25}\), the longer term (i.e. to 2009/10) prospects for feed in the EU-15 point to an increasing demand for EU sourced cereal feeds, stimulated mainly by their increasing competitiveness due to a favourable price development vis-à-vis other sources. This factor will be accentuated by an increasing demand altogether for feed, although at a slower rate that has hitherto been the case. Demand for EU-sourced oilseed feeds will also experience some growth, but to a lesser extent than cereals. The reasoning behind these projections is discussed below.

First, in terms of total demand for feed, short-term developments would remain dominated by the recent crisis in the animal sector, the beef cycle (which enters its downward path in 2002), the upwards adjustment in the pig meat sector and a relative stagnation in poultry meat production. After a relative stagnation in 2003 and 2004, global growth in feed demand would resume rising from 2005 onwards at the sustained pace of around 0.5 % per year owing to the robust developments in the white meat sector. The end of the decade, however, would be marked by a significant slowdown in feed demand that merely reflects less favourable perspectives in the pig and poultry sectors. Thus, the longer term prospects of a marked slowdown in the growth of white meat production and the declining trend in the size of the total EU cattle herd are expected to limit the average annual growth in the total demand for marketable feed products to around 0.3%, i.e. only a fifth of the growth observed between 1993/94 and 1999/00.

Second, DG AGRI suggests that a projected fall in EU feed cereal prices in the wake of the implementation of the Agenda 2000 CAP reform should boost the price competitiveness of EU cereal feed vis-à-vis their main substitutes. Thus, having recovered from 1998 to 2000, soybean meal prices would weaken in the short term before strengthening from 2003/04 to reach 214 $/t in 2009/10. The impact for the EU feed sector of these fluctuations in meal prices would be accentuated by the changes in the $/€ exchange rate. Conversely, the prices of corn gluten feed would slightly fall in the near term before stagnating over the medium term at around 84 $/t, whereas manioc prices would decline broadly in line with EU domestic cereal prices in order to remain competitive in the EU (after a short-term fall, they would stabilise around 70 $/t).

Notwithstanding the recovery on world markets, both in prices and trade opportunities, the reduction in cereal support prices in the early years of the decade is projected to lower the general price level of feed cereals over the medium term. Most feed cereal prices in the EU would trade at

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\(^{25}\) DG AGRI: “Prospects for Agricultural Markets 2002-09”, June 2002. The projections are for the EU-15, i.e. do not take into account the effects of EU enlargement (which are presented in a separate section here).
or below support price levels throughout the whole period as they would remain under pressure from excess supply for some coarse grains (notably rye and barley) and delicately balanced markets for other feed cereals, some of which do not benefit from price support (feed wheat, oats and triticale). These factors would combine to restrain any significant price increases.

In spite of a substantial appreciation of the € assumed over the medium term – at least as compared to the situation as of April 2002 - the relatively weak $/€ exchange rate would exert some further strain on the competitiveness of the major imported feed substitute products by reinforcing the price competitiveness of EU feed cereals.

As a result of this improved price competitiveness, EU cereals are projected to capture a growing share of the total demand for marketable feed products. The total share of EU cereals would strongly increase from a 54.9 % average over the 1999/00-2000/01 period to 58.4 % in 2009/10. Most of these gains would be achieved over the first years of the projection period, when the cut in support prices translates into a fall in average feed cereal market prices. This growth in cereal market share would take place at the expense of the “protein-rich” and “energy-rich” products whose market share would drop by 0.7 and 2.8 percentage points respectively.

DG AGRI thus projects that the total feed use of cereals in the EU-15 would grow by 7.7 mn t to reach 124.4 mn t by 2009/10 on account of an increased demand for marketable feed products and an improved market share. However, the corresponding annual average growth rate in cereal feed demand of 0.7 % from 2000/01 to 2009/10 would constitute a considerable slowdown relatively to the 1992/93-1999/00 period (4 %). It would also represent a downwards revision from last year’s prospects owing to less favourable medium-term developments projected for the animal sector which would in turn generate lesser growth in total demand for marketable feed products.

The distribution of this increased global feed demand for cereals would mainly depend on the development of their relative market prices, although specific patterns can be identified such as the increasing use of wheat for feed purposes and the continuous decline in feed barley usage. Since barley and other cereals appear less price responsive, much should depend from the price relationship between soft wheat and maize.

Soft wheat is projected to confirm its predominance as the main feed cereal in the EU over the medium term. Despite relatively firm prices, its share in the total cereal feed use would rise from an average 34.7 % in 1999/00-2000/01 to 36.3 % in 2009/10. Accordingly, soft wheat feed usage would grow from 39.8 mn t in 1999/00-2000/01 to 45.2 mn t in 2009/10, i.e. an increase of 5.4 mn t over the whole period. High productivity growth would enable feed wheat to restrain price increases and to maintain its price competitiveness with other feed grains over the medium term. In comparison with last year’s projections, soft wheat feed usage would be slightly affected by lower availability on the supply side and favourable prospects from external demand that should somewhat limit its gains.
Maize feed use would also rise by 5.2 mn t to reach 36.4 mn t in 2009/10, a 2 % point increase in feed market share thanks to its greater price competitiveness supported by high productivity growth. Most of soft wheat and maize gains would take place at the expense of barley, the use of which would fall by 2.9 mn t over the whole period. Barley feed use would reach 27.5 mn t in 2009/10, i.e. slightly more than a fifth of the total feed cereals consumed by animals. The projected decline in production levels and export demand are foreseen to exert pressure on barley’s feed market share.

These projections of cereal feed use show that the general fall in cereal prices generated by the implementation of Agenda 2000 would reinforce the trends observed in the EU feed market since the 1992 CAP reform towards an ever greater use of soft wheat and maize for feed purposes at the expense of barley. The development in maize production and its high productivity potential are expected to strengthen its price competitiveness in the feed market.

Prospects of higher demand for marketable feed products from the livestock sector would generate over the medium term an increase also in the demand for oilseeds and oilseed products in the EU. Notwithstanding the impact of the ban on the use of meat and bone meal in animal feed, this increase in the consumption of oilseeds and oilseed products should remain rather moderate as these protein-rich feed products would face greater competition from cereals. Given the modest medium-term perspectives for oilseed production in the EU, this demand should give rise to a slight increase in imports.

6.3.2. EU enlargement effects

Ten Central and Eastern European countries (CEECs) have applied to join the European Union (EU). The ‘front-runners’ for accession include Poland, Hungary, the Czech Republic, Slovakia, Slovenia and the 3 Baltic States. Adoption of the ‘acquis communautaire’ means that, in principle, the CEECs will adopt trade protection and subsidy measures under the CAP, while remaining barriers to trade between the EU and CEECs should be removed from day 1 of the accession. Within the current timetable and progress of negotiations, it is likely that accession of the first members will take place on 1 January 2004.

The EU and the CEECs appear to have significant similarities in their supply balances of protein feeds. Although the current deficit position in the CEECs is considerably better than in the EU (close to self-sufficiency for both cereals oilseeds), the CEECs rely considerably on imports for their supply of oilseed meal (around 55% self-sufficiency). The main supplier of meal at the moment is the EU-15 (around 40% of CEEC-10 imports in the late 1990s), followed by Brazil (around 35%) and Argentina (10-12%).

At the same time, a key difference between the groups is in the composition of ingredients in animal feed: while in the EU-15 the current ratio of cereals to meal use in animal feed is about 10:3.5, in the
CEECs it is much higher at 10:1. This demonstrates a low uptake / large shortage of feed protein at the moment in the CEEC-10 and is reflected in the low feed efficiency ratios.

Assuming a boost to the livestock sector in the CEEC-10 post accession stimulated by growing demand for meat (especially for leaner, higher quality meat) as incomes rise, the demand for feed and especially for meals can be projected to rise further, thus further increasing the enlarged EU needs for oilseeds and meals. Whether the CEEC-10 oilseeds sector can respond to this demand will depend on whether more land can be shifted into oilseed production and/or technical improvements in yields, as well as the expansion of current crushing capacities which will require significant investment in this sector.

Existing forecasts are not pointing to such a development. In its latest projections, the European Commission estimates that the total area under cereals and oilseeds in the CEEC-10 is likely to decline slightly from current levels, to reach about 26.8 mn ha in 2008, or just under the average cereal area of 1999-2002 (Error! Reference source not found.).

It should be noted that these projections do not make any assumptions regarding the conditions and timing of the accession and assume a continuation of current policies in the individual CEECs. However, the adoption of EU policies post accession could lead both to a change in total cereal & oilseed area and to a shift between the two crops. The extent of the shift will depend on how the adopted CAP will influence relative prices between the two crops and farm incomes, compared to the current policy environment.

The DG AGRI projections are that, in the long run, the more favourable world market conditions for oilseeds and the stagnant prices for cereals would lead to a gradual increase in the CEEC-10 oilseeds area to 3.6 mn ha by 2009, against a slight reduction in cereals area down to a level of 23.3 mn ha by 2009 (Error! Reference source not found.). The exact amount will also depend on how much area is transferred from production of other crops, grassland production or from arable land which is currently unused. However, most of the projected increase in land use will go into (the relatively low yielding) sunflower, while rapeseed areas will remain relatively stable (this crop has traditionally been important in Poland and much less in Slovakia) (Figure 11). The soya beans area is projected to remain stable at around 100,000 ha (mostly in Romania).

Following the projected increase in oilseeds area, production would increase by 1 mn t from 5.1 mn t in 2002 to 6.1 mn t in 2009 (which is just above the total CEEC-10 record crop in 1999). The main

27 The projections are based on a combination of different approaches (statistical analysis, expert judgement, etc.). This includes a short-term appreciation of the most likely development in 2001 based on current knowledge of weather conditions, prices, market situation, etc. The medium-term projections are based on implicit status quo assumptions on policies and agricultural as well as general economic conditions, i.e. they assume the continuation of current policies while no assumptions have been made concerning the date and conditions of entry to the EU.
expansion in production is expected to come, however, from the relatively low yielding sunflower in Hungary, Bulgaria, and Romania. In fact, yields are expected to grow at a lower rate than those for cereals, and, as in the EU-15, the increase should be higher for rapeseed than for sunflower (very limited increase). Sunflower accounts for more than 60% of the oilseed area in the CEEC-10, but only 40% of the total oilseed production, due to its significantly lower yield compared to other oilseeds. It is mainly grown in Romania, Bulgaria and Hungary.

Figure 10  Projected cereal and oilseed area in CEEC-10, 1999-2009

Source: European Commission (DG AGRI)

Figure 11  Projected oilseed area by type of crop, CEEC-10, 1999-2009

Source: European Commission (DG AGRI)
In terms of the use of cereals for animal feed, due to an expected increase in animal production in the CEEC-10, an increased use in the period up to 2009 is foreseen. Total cereal feed use is thus projected to go up by nearly 3.5 mn t, from 44.3 mn t in 2001 to 47.5 mn t in 2009 (mostly wheat and maize). The largest growth in feed demand is expected to occur in Poland and Hungary (but also Romania and Bulgaria) as a result of growing pork and poultry production. An increased use of protein-rich meals may also be foreseen if internal crushing capacities improve allowing this to take place.

6.4. Scenarios for an increase in EU protein crop production

In order to investigate the potential for an increase in protein crops production, our economic analysis concentrates on 3 main policy scenarios, based primarily on the key factors influencing production (as outlined in section 3 above) and our legal and agronomic analysis:

1. Status quo (i.e. continuing implementation of Agenda 2000 provisions)
   The maintenance of the status quo in terms of support for vegetable proteins would effectively mean that oilseed arable area payments would remain aligned with those of cereals. This would therefore provide no adequate incentive to increase output of vegetable proteins or indeed reverse the decline in areas experienced since the implementation of Agenda 2000.

2. Re-differentiation of direct payments
   To re-introduce differentiated payments for oilseeds would be the most effective way of increasing vegetable protein output in the EU-15. The level of increase in output will depend on the extent of the direct payments provided and our modelling will simulate the effects of a significantly higher level of direct payment.

3. Mid-Term Review
   The key element of the MTR proposals as far as oilseeds and protein crops are concerned are that it is proposed to increase the arable area payment for cereals and oilseed crops by Euro 3/t to compensate for the proposed 5% cut in cereals intervention price. In addition the current protein crop supplement of 9.5 Euro/t will be converted to a stand-alone payment of 55.57 Euro/ha. This is 9.5 Euro/t multiplied by the average EU reference yield of 5.85 t/ha. The effect on the competitive position of protein crops and oilseeds will be quantified via the CAPA model but ex-ante we would not expect these changes to result in a significant increase in production since cereals and oilseeds are being treated equally and there is no change on average for protein crop payments. Also from 2004 onwards it is proposed to cut the direct payments by 3% per year (‘dynamic modulation’).
6.5. Economic assessment

At this stage of the research, we carry out a simulation exercise utilising the Common Agricultural Policy Analysis (CAPA) model for the EU-15 arable sector. CAPA is an econometric model that provides a stylised statistical representation of the arable sector in the EU-15 and other Member States.

CAPA is an allocation model. As such, it contains a set of equations that explain how the total arable area available for cultivation is distributed among different crops. The model is based on the assumptions that producers attempt to maximise their profit and that agricultural arable land can be characterised as a fixed or finite resource as plantings are constrained by the base area less the area that is set-aside. The planting decision is based on the profitability of each crop and producers will choose their crop-mix, allocating the fixed arable land between different crops in order to achieve the maximum profit. Thus, different crops compete for land. The share of each crop in total arable land therefore depends on its relative profitability. The parameterisation of the economic relationship between profitability and crop area provides the core of the CAPA model.

The simulation exercise will quantify the impact of the scenarios that will stimulate protein crop production on the EU arable sector in terms of:

- area under arable crops (cereals, oilseeds and protein crops);
- production volumes of arable crops;
- revenue and gross margins per hectare; and,
- aggregate gross margins.

The simulation results will be compared with actual data for 2001 or forecasts up to 2006 based on the Agenda 2000 policy environment in order to assess the impact of the proposed scenarios on variables of interest in the longer term.

In addition, for each proposed scenario, we will estimate the budgetary implications and compare them to the current budget requirements of Agenda 2000. This will provide us with an overall picture of the costs and benefits of each policy scenario.

Results will be compared against the European Commission’s simulations, as outlined in (COM(2001)148f of 16/3/2001).
6.6. Conclusions

The final conclusions of this report will depend on the results of the modelling run which will be undertaken following the presentation of this Interim Report. The preliminary conclusions of the agronomic, legal and economic analysis are presented in the previous sections.