



**EUROPEAN COMMISSION**  
DIRECTORATE-GENERAL FOR AGRICULTURE AND RURAL DEVELOPMENT  
Directorate G. Economic analyses and evaluation  
**G.5. Agricultural trade policy analysis**

# **AGRICULTURAL COMMODITY MARKETS**

## **PAST DEVELOPMENTS AND OUTLOOK**

**FEBRUARY 2006**

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## LIST OF ACRONYMS AND ABBREVIATIONS

|        |   |
|--------|---|
| bio    | Billion   |
| BSE    | Bovine Spongiform Encephalopathy (“Mad cow disease”)  |
| CAP    | Common agricultural policy  |
| EBA    | “Everything but Arms” agreement   |
| EU     | European Union  |
| EU-15  | Austria, Belgium, Denmark, France, Finland, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom |
| EU-25  | EU-15 plus Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia                                     |
| FAO    | Food and Agriculture Organisation of the United Nations   |
| FAPRI  | Food and Agricultural Research Policy Institute   |
| FOB    | Free on board   |
| FSU    | Former Soviet Union   |
| FMD    | Foot and mouth disease  |
| GMO    | Genetically Modified Organisms  |
| Kg     | Kilogram  |
| mio mt | Million metric tonnes   |
| OECD   | Organisation for Economic Co-operation & Development  |
| p.a.   | Per annum   |
| PS&D   | Product supply & demand   |
| SMP    | Skimmed milk powder   |
| SPS    | Sanitary and Phytosanitary  |
| US     | United States of America  |
| USDA   | United States Department of Agriculture   |
| WMP    | Whole milk powder   |
| WTO    | World Trade Organisation  |

## AGRICULTURAL COMMODITY MARKETS PAST DEVELOPMENTS AND OUTLOOK

### EXECUTIVE SUMMARY

This report analyses the evolution of world agricultural commodity markets over the course of the last 25 years and anticipates the potential changes that will likely take place over the coming decade. It is primarily based on the medium term outlook of the Organisation for Economic Co-operation and Development (OECD) and the economic forecasts of the Food and Agricultural Policy Research Institute (FAPRI).

**Cereals** production and consumption has grown at very modest rates since 1980 and is forecast to continue at this pace for the next decade with the coarse grains market remaining slightly more dynamic than wheat. The EU is forecast to maintain its current level of exports and thus is expected to slowly lose part of its market share, especially in the coarse grains sub-sector. Australia and Argentina will most likely benefit from this in the wheat market, and the US and Argentina in coarse grains. No significant change in cereal prices is expected.

Although a major grain, **rice** receives less attention in world markets because trade represents a small share of world production. The main producing and consuming countries are in one region: Asia. Small changes in the domestic situation of these countries, including adjustments in policy, can have a significant impact on trade and prices. Production and trade are forecast to grow to meet the increasing demand, i.e. they will be driven by population growth.

World **oilseed** production and consumption has grown at robust rates in the last quarter of a century and, although this growth rate could drop somewhat in the next 10 years, it is nevertheless expected to remain double that of cereals. In order to bring demand and production into balance nominal oilseed prices could rise modestly. Brazil will overtake the USA as the most important oilseed exporter. China could double its imports and, therefore, absorb almost half of the oilseeds traded in 2014/2015. The EU will remain the second major importer.

Production and consumption of **oilmeals** will basically follow the growth pattern of oilseeds although the share of oilmeals traded is unlikely to increase further as crushing capacity improves where the meals are consumed. Argentina and Brazil together are expected to account for at least three quarters of world oilmeal exports in 2014. The EU, already by far the most important importer is likely to increase its imports further.

Global consumption and production of **vegetable oils** has increased at the fastest pace of all sectors in the oilseeds/meals/vegetable oils complex and is expected to continue doing so. Two thirds of all vegetable oil exports in 2014/2015 will come from Malaysia and Indonesia. The EU as a net-importer will continue to rank behind China and India. Due to strong demand, vegetable oil prices are likely to strengthen over the next ten years.

**Sugar** stocks started rising in the mid 1980s when production grew faster than consumption. This was particularly marked in Brazil where consumption has increased by one third over the last decade while production has more than doubled. As a result of

this surge in low-priced Brazilian exports and growing stocks worldwide, world prices sharply declined in the second half of the 1990s. However, the market has been more balanced in recent years and, according to forecasts, growth in production should now be more or less in line with that of consumption.

**Cotton** has received much attention in recent years for farm policy reasons, yet little of this has focused on the major transformation in cotton markets. While world production, uses and trade of cotton lint remained fairly flat throughout the 1990s, they have significantly increased since 2000 and will further expand following the end of the multifibre agreement in 2005. China is the leading producer and user of cotton lint and its net trade position has a direct impact on world prices. It is expected to remain a key net importer, as well as some other Asian countries, while the US and Africa will remain key exporters.

**Beef** has been the least dynamic of the livestock sectors over the last twenty years. Moreover, production and consumption have been repeatedly disrupted by animal diseases such as BSE and FMD in various regions of the world. Beef and veal consumption and production is projected to grow considerably faster than it has over the past decades. Trade is also projected to expand and represent around 10 % of world production. The EU, which was the main beef exporter in the 1990s, became a net importer in 2003 thanks to continued reductions in its herd size and projections suggest the EU's beef trade deficit will increase in coming years. Brazil is expected to be the world's largest beef exporter and could more than double its current exports (0.8 mio mt) by 2014.

Although world **pigmeat** consumption and production ranks second to poultry in terms of recent growth, it remains the more important sector in terms of quantity (92 mio t were produced in 2000-2002). Asia is the dominant region in this sector, accounting for 56 % of world production and consumption and China is single-handedly responsible for almost half of world consumption and production. The growth of the world pork sector is projected to slow down over the next decade. The EU's share in world exports (about one third for many years) has shrunk in the recent past as Canada and Brazil have gained importance and strengthened their export position, and the USA has switched to a net-export position.

The **poultry** sector has been the most dynamic meat sector in the past twenty years. Having experienced strong growth and overtaken the beef sector in the mid 1990s, it is now the second most widely consumed meat. The spread of the Avian Influenza has the potential to cause the first major disruption for the world poultry sector, with significant negative impacts on the feed cereals and oilseeds/oilmeal markets. Brazil's production grew faster than its consumption over the period under consideration and in 2002-2004, its production levels were close to those of the EU-15 at almost 9 mio t. Thailand has also established itself as an exporter with a net-trade comparable to, or even higher than that of the EU-15. Major importers are Russia and Japan, followed by Saudi Arabia and Mexico. Poultry consumption and production is projected to increase at slightly more than 2 % annually from 2005-2014, less than half the rate observed over the past two decades. Trade in poultry meat is likely to increase faster than production and consumption.

World **cheese** production and consumption have increased substantially over the last two decades, reaching around 17 mio t. Production and consumption is largely concentrated in Europe and North America, which together represent around 80 % of world production

and consumption. Cheese consumption and production is expected to continue its growth and could reach around 21 mio t in 2014, although the share of cheese traded would remain below 7 %. Oceania, with less than 4 % of world production, is expected to remain the world's largest cheese exporting region and could increase its world market share to around 50 %. The EU-25 will reduce its share of the world cheese market in line with the decrease in exportable surplus following the projected increase in domestic demand and the limited production capacity linked to fixed milk quotas. Japan and Russia are projected to remain the greatest cheese importers, even though their share is set to decrease slightly over the medium term.

World **butter** per-capita consumption has decreased over the last two decades. While European consumption dropped sharply as a result of lower butter production following the introduction of milk quotas and the negative economic impact of the collapse of the FSU, Asian consumption grew rapidly (however Asian per capita consumption is still very low). The world's largest butter consuming and producing country is India, which has seen outstanding growth rates in both over the last quarter of a century. Butter consumption and production is expected to continue its slow growth in line with growing demand in Asia, with the share of butter traded remaining below 8 %. New Zealand and Australia are expected to remain the world's largest butter exporters and could increase their combined share of the world market to more than 70 %. The EU-25 will reduce its share in the world butter market from around 30 % in 2004 to 20 % in 2014 (even assuming a continuation of export refunds). Russia is projected to remain the greatest butter importer, even though its share is set to decrease slightly from a quarter of world butter trade in 2004 to just below 20 % by 2014.

World **skimmed milk powder (SMP)** consumption has been declining since the mid 1980s, as the introduction of milk quotas in the EU (the world's largest producer and consumer of SMP) resulted in lower SMP availability. Use of SMP for calf feed in the EU decreased substantially, from 80 % of total consumption in 1980 to around 40 % in 2002. While FAPRI foresees a gradual increase in SMP production and trade, the OECD expects the recent slow down in production to continue. Oceania is expected to remain the world's largest SMP exporting region and could increase its share of world market share to nearly 50 %. The EU-25 is projected to reduce its share of the world SMP market, from around 25 % in 2004 to 15 % in 2014, in line with lower production due to CAP reform price cuts. South-East Asian countries, notably Indonesia and the Philippines, remain the main destination for SMP. Mexico is the other main SMP importer.

World **whole milk powder (WMP)** consumption has remained stable since the mid 1990s, as the drop in European consumption was compensated by the growth in Asia and Latin America (where WMP is used for reconstituted milk). World WMP production, consumption and trade are projected to grow at a fast pace over the medium term. Oceania is expected to remain the world's largest WMP exporting region and could increase its share of the world market to 75 %. Argentina is also expected to increase its exports over the medium term, and to attain over 25 % of the world market share while the EU-25 will lose part of its share, even assuming an unchanged export refund policy. South-East Asian countries, notably Indonesia, are to become important importers of WMP. 80 % of world WMP imports are in developing countries.

# **AGRICULTURAL COMMODITY MARKETS PAST DEVELOPMENTS AND OUTLOOK**

## **1. INTRODUCTION**

This report analyses long term developments on world agricultural markets for the main commodities and players, starting in 1980 and looking forward to 2014. It is based on data and publications produced by the main international organisations and institutes which provide forecasts for agricultural markets. For each commodity, the report identifies the key changes that have emerged over the last 25 years and comments on projections for the medium term.

The main source for historical data is the Food and Agriculture Organisation (FAO). For the outlook, a comparison is drawn between the 2005 baselines of the FAO-OECD (Organisation for Economic Co-operation and Development) and FAPRI (Food and Agricultural Policy Research Institute). Both have been chosen because of the extent of information they provide, in particular in terms of their detailed regional and product coverage. In some cases, reference is also made to the baseline produced by the USDA (United States Department of Agriculture) through its interagency World Agricultural Outlook Board.

Special emphasis is put on a selection of countries which constitute the usual or new main players for world agricultural markets. Further specifications on the commodity and country coverage can be found in the methodological note in the appendix. This note also includes a list of the standard graphs and tables that are available for each commodity. The present report only shows a small selection of these graphs. The full set of data for each commodity is available on the following internet site:

[http://europa.eu.int/comm/agriculture/publi/index\\_en.htm](http://europa.eu.int/comm/agriculture/publi/index_en.htm)

The aim of this report is to contribute to a better understanding of agricultural markets, particularly within the context of the ongoing Doha Development Round of multilateral trade negotiations. In particular, it analyses the implications of shifting agricultural production patterns on world commodity markets.

The closing date for this report was February 2006.

## 2. KEY MACROECONOMIC VARIABLES

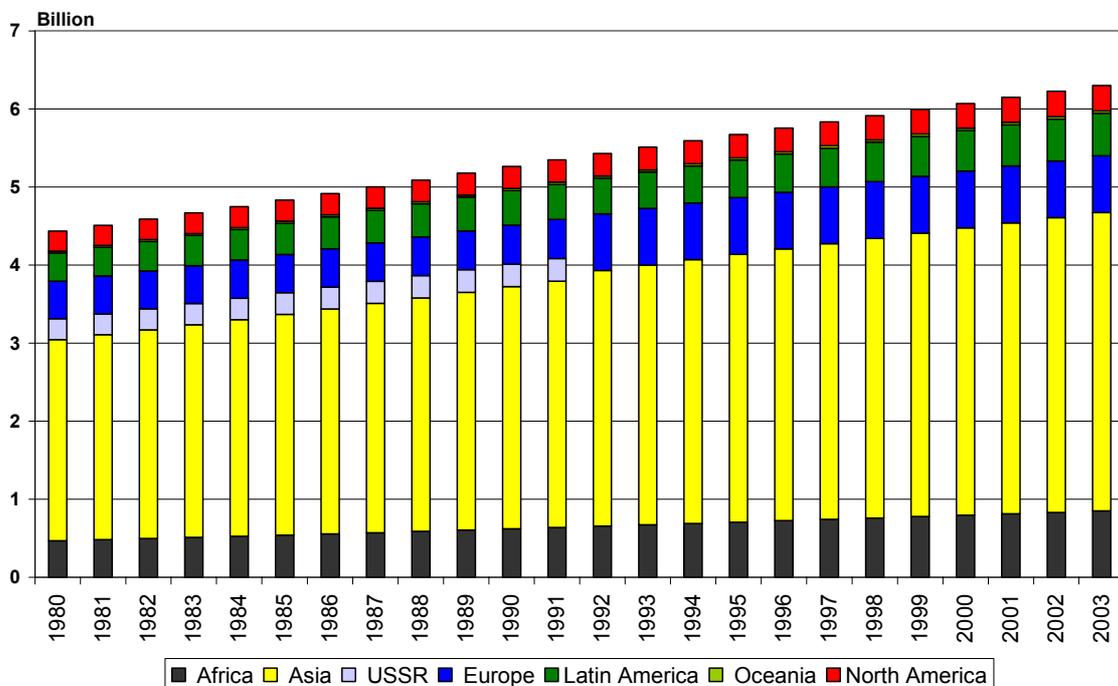
Three main driving factors can be identified to explain market developments: population growth, GDP growth and exchange rate developments.

### 2.1. Population

#### *Developments since 1980*

Population growth is a traditional determinant for food demand. Global annual population growth has been steadily declining since the second half of the 1960s, from 2.1 % to 1.3 % in 2000.

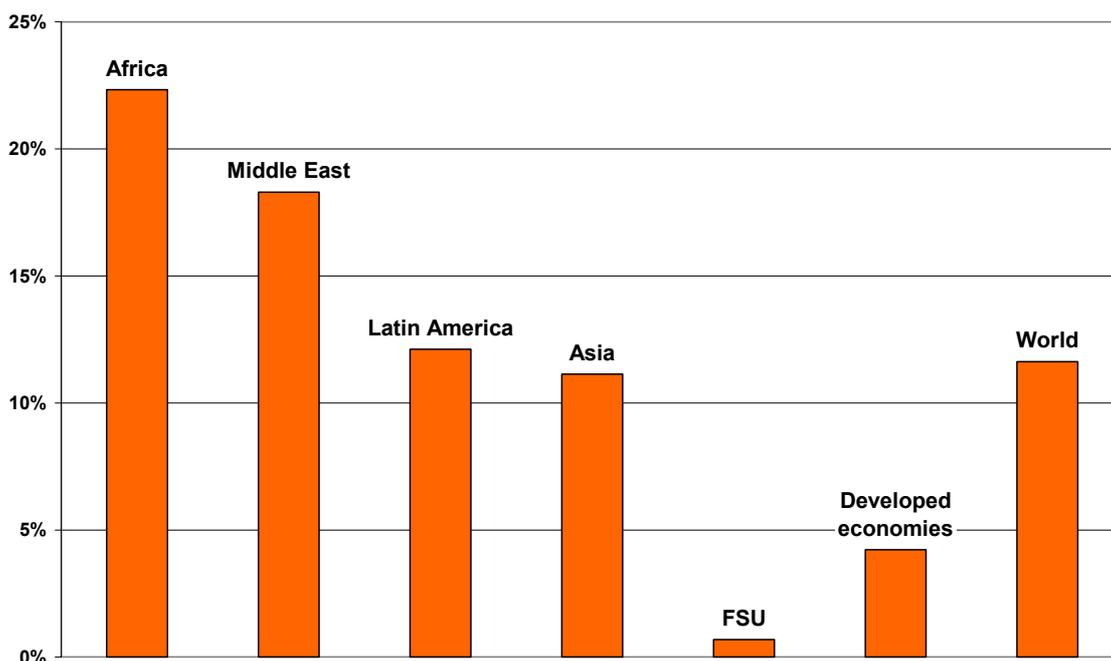
**Graph 2.1 Population by world region**



However, while growth rates may have declined, the world population has continued to grow at a relatively fast pace (+ 1.5 % per year over the 1980-2003 period, i.e. from 4.4 to 6.3 bio), especially in Africa (+ 2.6 % p.a.) and Latin America (+ 1.8 % p.a.). Asia's population growth is slower, (+ 1.4 % p.a. over the last decade) but still represents the highest increase in absolute terms (with an increase of 550 mio people between 1992 and 2003) and 3 out of 5 people live in Asia. European population increased slightly until the mid 1990s, but has been declining since. North American population showed positive growth rates, and population increased by nearly 70 mio between 1980 and 2003.

This pattern is estimated to continue with world population anticipated to increase by around 75 to 80 mio persons per year over the projection period. Overall world population is expected to increase by 1.1 % per year by the beginning of the next decade, a period which is expected to witness some of the highest absolute annual increments in world population history. The pattern of population growth will differ widely between regions, with Africa and the Middle East showing the highest increases (up by 22 % and 18 % respectively over the next decade).

**Graph 2.2 Cumulative population growth, 2005-2014 (in %)**



Source: FAPRI

The strongest annual growth is expected in Africa where population could expand by around 2.1 % across the forecast period while the Middle East's is expected to be growing at around 1.6 % p.a. according to FAPRI projections. After this, the fastest growing regions are Latin America and Asia, both of which are expected to averaging annual growth of around 1 % per annum by 2014. More than 90 % of the increase in world population is likely to take place in developing countries, with half of this in Asia. By contrast, most of the new EU Member States and other transition economies are projected to see a fall in their overall population.

## **2.2. Gross Domestic Product (GDP) growth**

### *Developments since 1980*

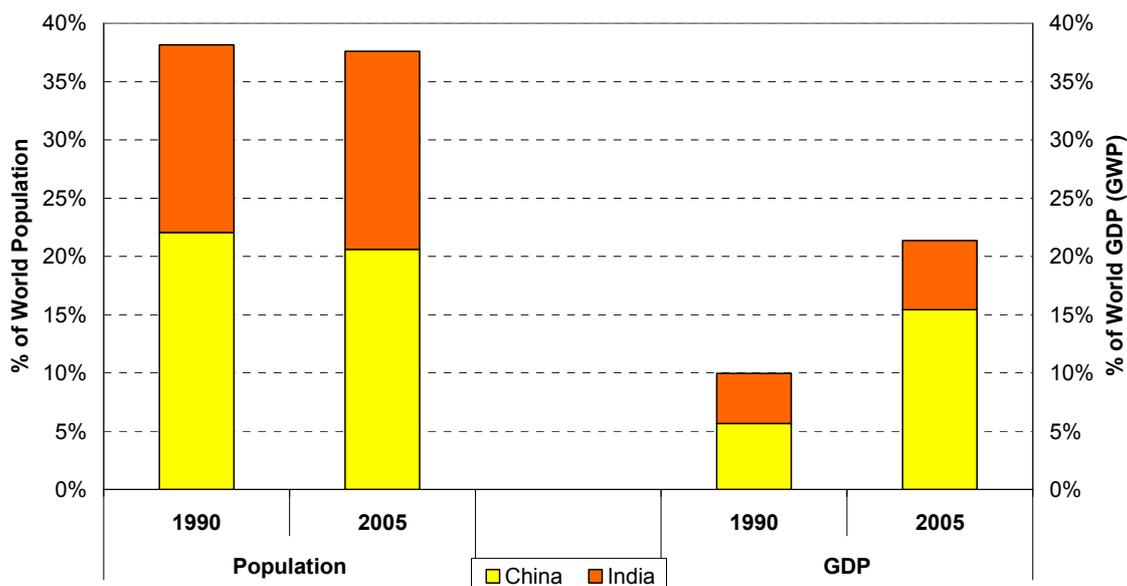
The main factor affecting market and price developments is probably the macro-economic environment, as higher per capita income has profound repercussions on the nature and composition of global food demand because of the direct correlation between per capita growth in income and diet diversification.

World GDP grew at an average annual rate of 2.7 % over the 1980-2005 period. This average rate hides marked differences between countries and regions and, within the same countries, between periods. Asia recorded the highest growth rates (+ 3.9 % p.a.), followed by Oceania (+ 3.3 % p.a.) and North America (+ 3 % p.a.) while Africa (+ 2.6 % p.a.), Latin America (+ 2.4 %) and Europe (+ 1.9 %) were below the world average. In terms of size of the economy, Europe has seen a drop in its share of world economy, from more than 42 % in 1980 to less than 35 % in 2004. Asia absorbed most of it, and increased its share in the world economy from less than 20 % in 1980 to more than 25 % in 2004. The share of other regions has remained broadly stable over the last 25 years.

The exceptional growth which was observed in Asia is the result of strong growth rates in South East Asia in the eighties and of the steady 9 % annual growth throughout the 1980-2005 period in China. In October 2005 China, following the publication of census results, reviewed its GDP estimate for 2004 and increased it by 16 %, which brings the average annual growth for the period 1980-2004 to more than 10 %.

The Indian economy has also shown remarkable and steady growth rates of close to 6 % per year, increasing the weight of these two Asian countries both in terms of population and production.

**Graph 2.3 China and India, share in world population and GDP**



The limited growth for Europe is linked to both the collapse of the Former Soviet Union and the economic transition that followed, and to the mediocre growth observed in the EU (+ 2.1 % p.a. over the 1980-2005 period).

#### *Outlook 2005-2014*

The main factor likely to contribute to improvements in the medium-term outlook of agricultural markets in all baseline projections are the prospects for a favourable macro-economic environment based on sustained and balanced growth across most countries.

Demand for meat products, processed food and beverages are expected to rise in developing countries in line with wealth. A higher degree of urbanisation and openness to trade would also translate into a shift in demand for wheat-based products and meat, with an ensuing increase in demand for coarse grains and other feedingstuffs (as it takes more cereals and oilseeds to produce a unit of calories from meat than it does through the direct human consumption of these crops).

Over the medium and long term, most agencies anticipate that long-term structural reforms and robust productivity growth should set the stage for a sustained economic growth in most economies, with economic expansion above long-term averages in most regions. If Asia remains the major force in the expansion of the world economy, strong growth is expected in the transition economies of Eastern Europe and Russia, Africa and Latin America, leading to a significant narrowing of the growth differential between these regions. This broadly-based economic growth could then have major implications for global food demand as it could trigger significant changes in the food consumption pattern in many developing countries.

FAPRI and the USDA anticipate that economic growth will stabilise at approximately 3.1-3.3 % per year. If much of this growth is expected to be fuelled

by emerging economies, the slow implementation of structural reforms should constrain growth prospects below the rates recorded during the 1990s in some of these countries.

According to the USDA projections, Asian developing countries will see an average annual GDP growth of around 4 % per year (led by China with an annual growth rate of 7.3 %), i.e. somewhat lower than in the 1990s. A similar performance is projected for Latin American economies, with economic growth reaching approximately 4 % a year on average over the medium term.

Most of the GDP assumptions are based on moderate developments in oil prices, which still result in an average economic growth at or above 4.5 % per year for Middle East countries, i.e. surpassing the performance of the 1990s. In spite of political difficulties in some countries which could drag its overall growth down, Africa is nevertheless forecast to display a positive economic pattern, with GDP growth estimated above 4 % over the medium term. However, GDP growth per capita in Africa and the Middle East would remain lower than that of Asia and Latin America by a larger margin than their GDP growth rates indicate owing to their anticipated population growth.

Over the medium term, the USDA and FAPRI baselines foresee a continued expansion of the Russian economy. This performance would in any case constitute a substantial increase from the negative growth recorded during most of the 1990s (around - 4 % per year). These prospects appear to depend critically on the process of implementation of structural reforms towards a market-based economy and the continuation of Russia's integration into the global economy in terms of trade, foreign investment and currency convertibility. In that respect, the medium-term economic and financial prospects in that region constitute a major uncertainty for the future prospects of agricultural markets.

Over the medium term, GDP growth in developed countries is estimated to reach around 2.4 %, i.e. above the rates achieved in the 1990s as structural adjustments undertaken throughout the second half of the 1980s and early 1990s created a foundation for growth. However, the path to recovery is forecast to show significant differences. Economic growth in the US is expected to keep a long-term sustainable rate significantly above 3.0 % over the outlook period while significant structural problems are still expected to keep the growth of the Japanese economy on a modest growth path over the medium term (at around 1.7 % per year). In the EU, a less dramatic slow-down means economic growth is expected to show a more modest rebound and less robust medium-term growth perspectives than those of the US.

This environment of steady medium-term growth is foreseen to take place without significant inflationary pressures thanks to assumed moderate oil prices over the medium term -combined with a lower dependence of the economy on energy- and to a significant productivity growth. The recent surge in oil prices, which has not been taken into account in any projections, together with high freight costs and a continuing strong economic growth in China may call these assumed inflation rates into question.

### **2.3. Exchange rates**

Exchange rate fluctuations have had a major effect on agricultural trade flows and prices over the past decades. In recent years notable examples have been the devaluation of the Russian Rouble the late 1990s, the continued gradual devaluation of the Brazilian currencies and the sudden collapse of the Argentinean peso in 2002.

The three sets of baseline projections differ significantly regarding their assumptions on currency prospects over the next seven years. The USDA baseline broadly assumes that, after a further depreciation of the U.S. dollar in the near term, the dollar will appreciate again from 2007. A return to a strengthening dollar reduces US agricultural competitiveness and constrains export growth. This would be partially offset by longer term global economic growth, which increases the demand for US exports. In the USDA baseline China is assumed to maintain a policy of a fixed nominal exchange rate relative to the US dollar. However, even with a fixed nominal exchange rate, a higher projected inflation in China than the United States implies some real appreciation of the Chinese currency.

The OECD baseline assumes that the exchange rates against the US dollar that prevailed in 2004 are maintained throughout the projection period for most countries. Surprisingly, some depreciation of the Chinese and Russian currencies is also be projected, as well as further depreciation for Argentinean and Brazilian currencies. An appreciation of the Japanese yen is anticipated by the FAPRI baseline, together with a continued, albeit slow, increase of the euro over the short term and a drastic fall in the value of the Brazilian and Argentinean currencies over the whole outlook period.

### 3. CEREALS, EXCLUDING RICE

**Cereals** production and consumption has grown at very modest rates since 1980 and is forecast to continue at this pace for the next decade with the coarse grains market remaining slightly more dynamic than wheat. The EU is forecast to maintain its current level of exports and thus is expected to slowly lose part of its market share, especially in the coarse grains sub-sector. Australia and Argentina will most likely benefit from this in the wheat market, and the US and Argentina in coarse grains. No significant change in cereal prices is expected.

#### *Developments since 1980*

Over the last quarter of a century (1980-2004), the cereal sector has been one of the least dynamic of all agricultural markets.

**Table 3.1 Evolution of world cereals markets (mio mt)**

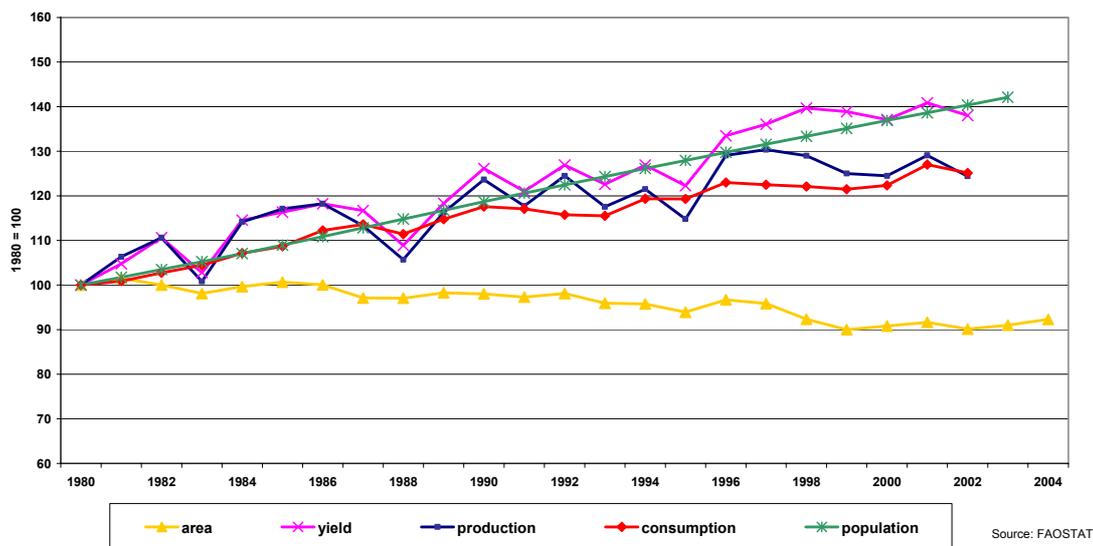
|         | <b>Production</b> | <b>Consumption</b> |
|---------|-------------------|--------------------|
| 1980/82 | 1090              | 1070               |
| 1990/92 | 1258              | 1235               |
| 2000/02 | 1300              | 1319               |

Global **cereals consumption** increased by a modest 1 % per annum (p.a) between 1980 and 2002. This was lower than the world population growth rate (see graph 3.1), meaning that the global **per capita consumption** of cereals has actually decreased. This is reflected in the consumption growth trend which, having increased by 1.2 % p.a. in the first half of this period, dropped to just 0.8 % between 1992 and 2002.

A substantial part of this slow-down can be attributed to the economic transformation of the Former Soviet Union (FSU), which brought about a sharp decline in cereals consumption. The EU-15 pattern has been slightly more varied: following a steady decline in consumption until 1992 (– 1.2 % p.a.), the subsequent reforms of the common agricultural policy lowered EU cereal prices substantially and fostered the use of cereals as feed, thus reversing the trend (+ 2.9 % p.a. over 1992-2002). In 2002, the last year available from FAOSTAT, EU-15 cereal use was 25 mio mt greater than that of the early 1980s.

Global **production** has mirrored the slow-down in consumption growth. Normal consumption and production of cereals (excluding rice) totalled roughly 1.3 bio t in 2000-2002.

**Graph 3.1 World total cereals growth, 1980-2004**

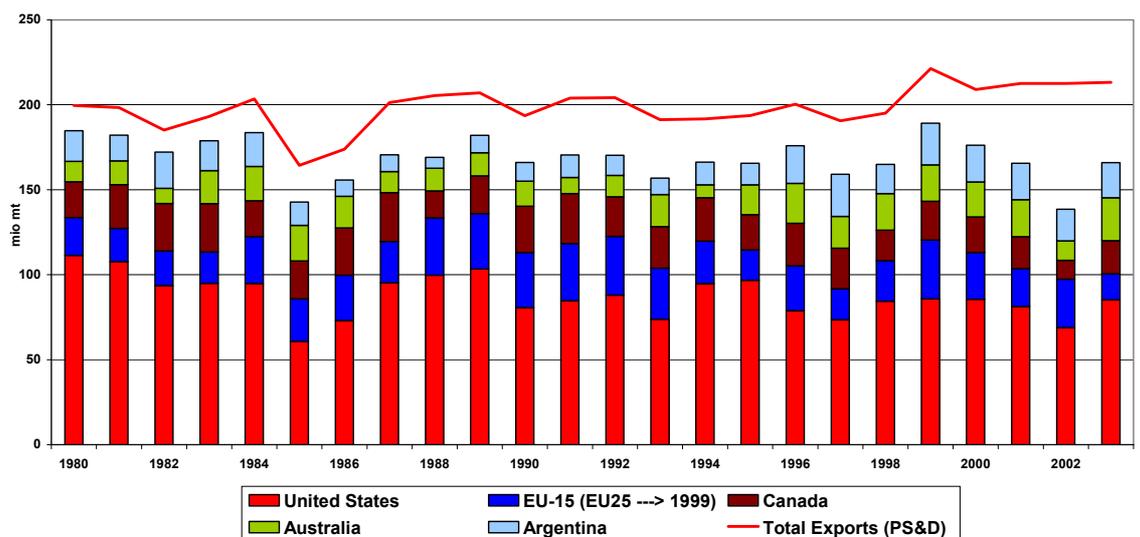


As the long-term increase in **yields** has outpaced consumption growth, world **cereals' acreage** shrank by 0.3 % annually between 1980 and 2004. This shift away from cereal production accelerated in the second half of the period, although recent figures suggest the acreage has stabilised since 1999. If one goes down to the regional level, this pattern can mainly be attributed to the transformation process in Russia, during which both agricultural production and the economy as a whole declined significantly.

Regional differences in cereals' yield increased over the whole period. Whereas in the early 1980s, yields in Africa were about one third of those in Europe and North America, virtual stagnation in growth means that African yields are now just one fifth of those in Europe and North America.

The quantity of cereals traded internationally is about 13 % of total consumption on average. In other words, seven out of every eight tons produced in the world are consumed in the same country. For decades, world **cereals trade** fluctuated around 200 mio mt per year, without any clear trend and, although it has lost some of its market share, the USA is still by far the most important grain **exporter**, followed by the EU, Argentina, Canada, Australia in varying order (see graph 3.2).

**Graph 3.2 World cereals trade, excluding rice**



Source: PS&D (USDA)

## Wheat

The cereals aggregate can be divided into two sub-groups: wheat (accounting for about 45 % of total cereals consumption and production) and coarse grains (55 %).

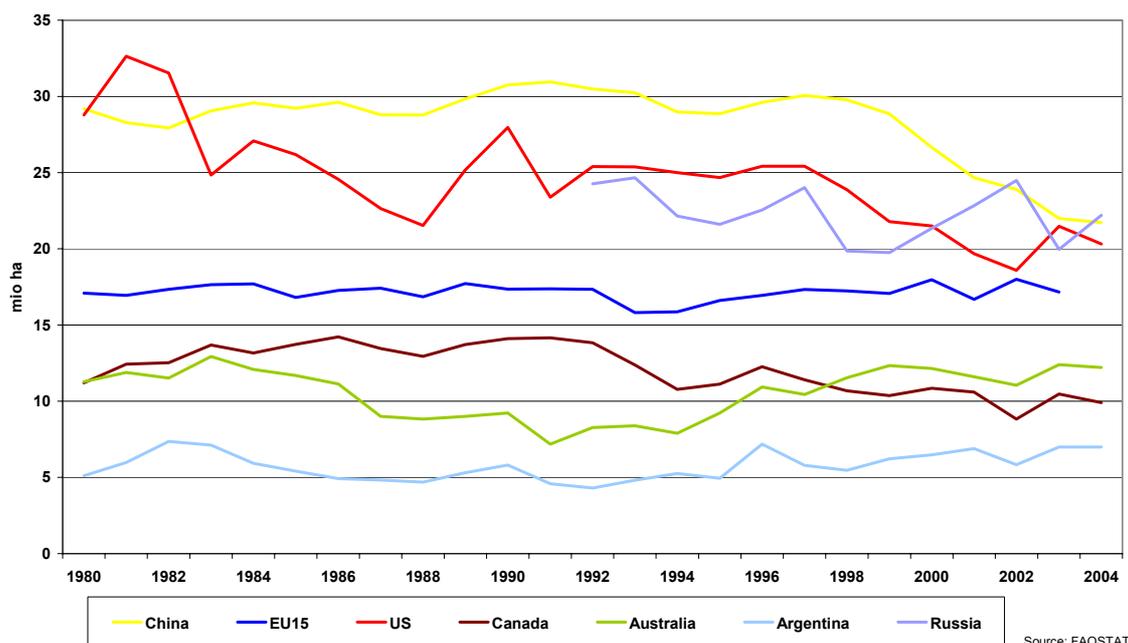
Historic trends of global **wheat consumption and production** differ only slightly from those of cereals: from 1980-2002, consumption growth (1.3 %) was higher than that of the overall aggregate, but this is due to a substantially higher growth rate in the first sub-period. In the second sub-period (1992-2002) the annual increase in wheat consumption also dropped below the 1 % mark and was close to that of all cereals.

**Table 3.2 Evolution of world wheat markets (mio mt)**

|         | Production | Consumption | Exports |
|---------|------------|-------------|---------|
| 1980/82 | 456        | 446         | 83      |
| 1990/92 | 568        | 551         | 93      |
| 2000/02 | 584        | 584         | 99      |

On a regional basis, this slowdown was caused by declining consumption in the FSU and China. Global **per-capita consumption** of wheat increased slightly in the first split period but decreased in the second. The EU and Australia are exceptions to this global trend, showing robust growth rates of per-capita consumption from 1992-2002 as well. As for the whole cereals' aggregate, wheat productivity improved faster than consumption, the result being that the world wheat area has been constantly adjusted downwards. The bulk of this reduction occurred in North America, in the FSU (in 1992-2004), and in more recent years, China (see graph 3.3).

**Graph 3.3 Wheat area, 1980-2004, main cereal producers**



Yield improvements have dropped sharply over the period: annual increases in yields receded from a relative high of 2.6 % in 1980-1992 to only 1.1 % in 1992-2004. This caused a slow-down in the reduction in area.

Normal consumption and production currently stands at between 580-590 mio mt. The share of wheat traded (about 17 %) is higher than the corresponding figure for all cereals. **World wheat trade** increased from 1980-2002 and totalled around 100 mio mt in 2000-2002.

The world's largest **wheat exporter** by far is the USA, followed by Canada, Australia and Argentina. The EU has lost export market share through the CAP reforms and the WTO reduction in export subsidies. In the Black Sea region Russia, Ukraine and Kazakhstan emerged as exporters with highly unstable export quantities; Ukraine has switched from net importer to net exporter status and back several times in the recent past. India is the only Asian country to export substantial quantities of wheat, although China (which usually appears on the importing side of wheat statistics) has also exported wheat sporadically in the recent past.

Wheat imports are much more evenly distributed between countries than exports: Japan and Brazil are the most significant importers, followed by Egypt, Algeria, Iran, Korea, Indonesia and Morocco. Under normal circumstances, each of them imports at least 3 mio mt per year.

## Maize

FAOSTAT does not provide data on aggregate coarse grain consumption. Instead, some of the major coarse grains are looked at here.

Normal **maize consumption and production** totalled about 610 mio mt in 2000-2002. Thus, maize is - in terms of quantity - slightly more important than wheat. Together, these two cereals account for about 90 % of world cereal consumption and production.

**Table 3.3 Evolution of world maize markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 431               | 418                | 68             |
| 1990/1992 | 504               | 504                | 64             |
| 2000/2002 | 603               | 618                | 73             |

Unlike wheat, world maize consumption has grown at a consistent and relatively robust pace of almost 2 % from 1980-2002.

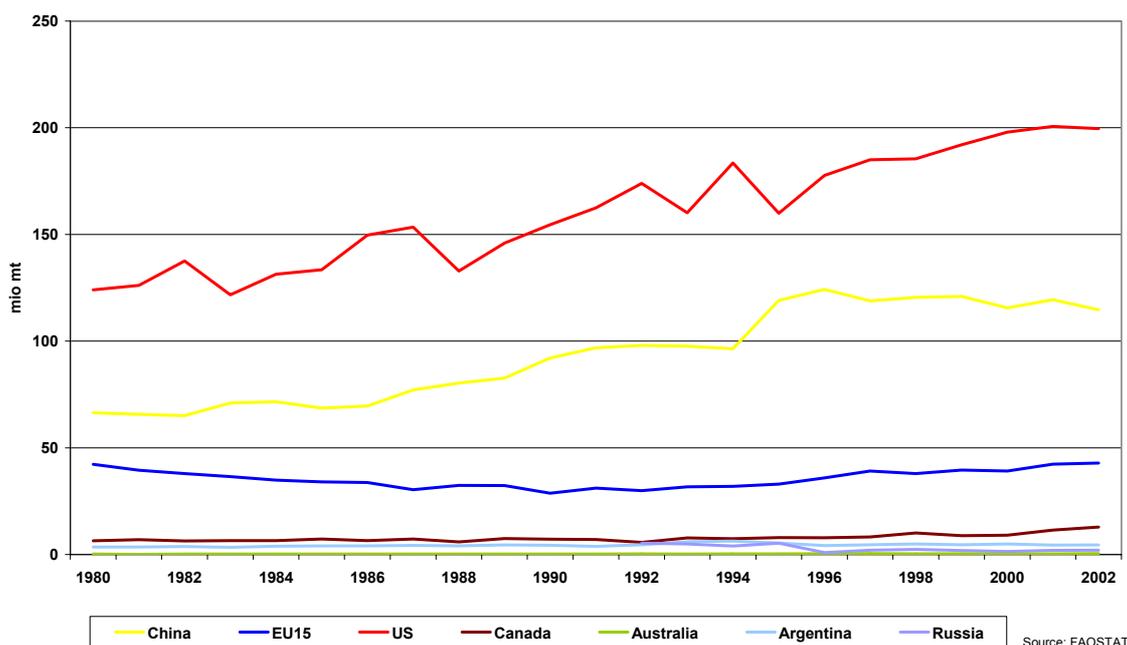
As the demand for meat has increased in line with real per-capita income increase, so too has the demand for maize (a major feedstuff in animal production). Consequently, the sector has seen increasing **per-capita consumption** since 1980 as production levels have steadily increased.

As the improvements in **yields** lagged slightly behind the increase in demand, **maize acreage** has expanded during the last quarter of a century, although the average growth in the global acreage under maize dropped from 0.75 % in 1980-1992 to 0.5 % in 1992-2004.

Unlike other cereals the expansion of the maize sector was evenly distributed over the world with one major exception (see graph 3.4): having fallen in the first sub-period (-2.8 % p.a.), EU maize consumption subsequently experienced strong growth (+3.7 % p.a.).

The relatively dynamic development of the maize sector – as compared to the remainder of the cereals aggregate – can be explained by two main factors: continued successful plant breeding and the massive adoption of genetically modified maize strains, both of which made maize more productive compared to other feed grains.

**Graph 3.4 Maize consumption 1980-2002, some selected countries**



**World trade** in maize underwent a full-cycle swing in 1980-2004: having stood at almost 80 mio mt at the beginning of the period, it dropped to about 60 mio mt in the early 1990s and has recovered again to close to 80 mio mt in recent years. The share of maize traded internationally is about 12 %, which is low compared to wheat.

By far the most important **exporter** is the USA (although its share fluctuates between 50 % and 75 %), followed by Argentina. Other maize exporting countries including China, South Africa and Brazil, all undergo periods in which they do not export, and even import under certain circumstances. This switch in trading status is particularly pronounced in the case of China, though in most recent years, it has sold its huge domestic surplus of maize with export subsidies onto the world market. More recently, Ukraine and Paraguay have also emerged as exporters.

Japan is by far the most important **importer** of maize, followed by South Korea: these two countries account for about 30 % of world maize imports. Other major importers include Mexico, Egypt, EU-15, Malaysia, Canada, Iran and Colombia.

## Barley

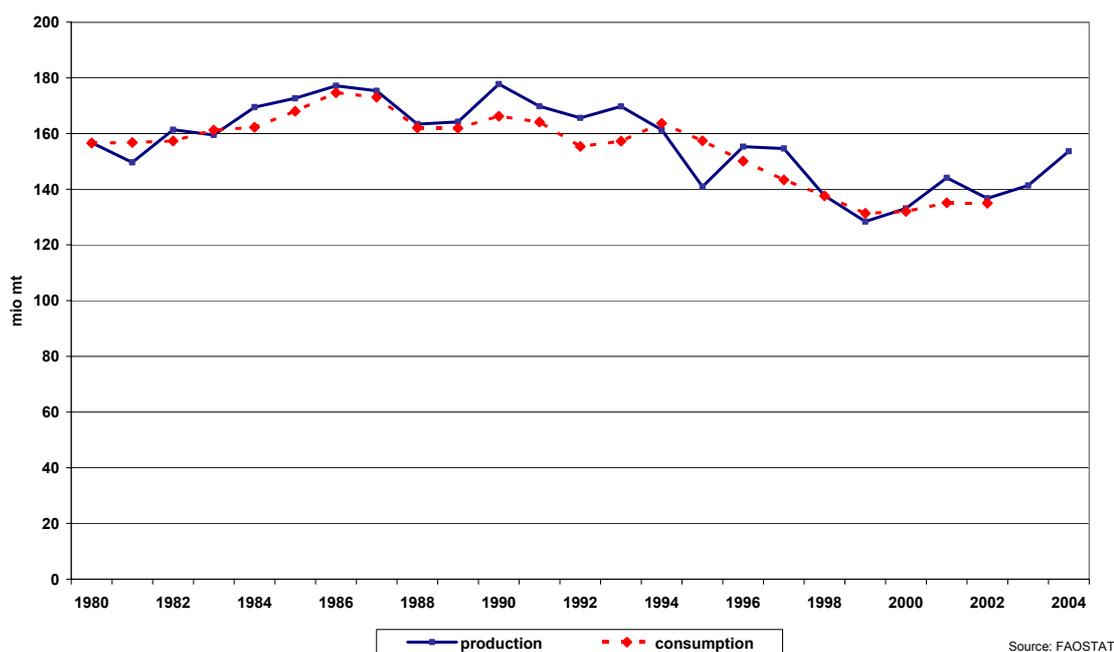
The barley sector displays different characteristics to those of other cereals. Firstly, a substantial part of the barley planted is intended to be high-priced malting barley, a sector in which growth is stagnating (though demand has fallen slightly in developed countries, it has increased in developing countries). Secondly, the final quality of the barley produced is highly influenced by growing conditions. If the requirements of the malting industry are not met, which is on average true for a large part of any given harvest, the low-quality barley enters the feed grain market where it has to compete with other cheap feed grains. Both factors mean that barley is split up into two distinct sub-sectors which are linked by weather conditions.

**Table 3.4 Evolution of world barley markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 156               | 157                | 14             |
| 1990/1992 | 171               | 162                | 17             |
| 2000/2002 | 138               | 134                | 17             |

One consequence of this particularity is that world barley consumption and production cannot be analysed using the “loglinear trend” type analysis used for the other cereals. This is evident if one looks at graph 3.5 which shows the development of global **consumption and production**. At the beginning of the 1980s, global production and consumption stood at roughly 160 mio mt, both peaked at almost 180 mio mt in 1986-1987 after a steady rise, and then followed a continued decline. The shrinking of the world barley sector seems to have bottomed out in 1999-2000 at about 130 mio mt and although production figures indicate a substantial recovery since then, current consumption and production is still lower than it was 25 years ago.

**Graph 3.5 World barley production and consumption, 1980-2004**



As world barley **yields** have steadily increased (+ 1.2 % p.a. from 1980-2004) the adjustment in production to account for decreasing consumption was implemented through a substantial reduction in **area**. Barley acreage was cut back by roughly one third from the early eighties to 1999 and recovered considerably in recent years. If one looks at the geographical distribution, almost all of this downward adjustment occurred in the two main barley-producing regions, but for different reasons.

In the EU-15, barley lost competitiveness due to a substantially weaker improvement in yields (as compared to wheat; this is especially valid for the sub-period 1980-1992) and due to the reforms of the support in the cereals sector from 1992 onwards. These increased support for wheat relative to barley (which was the

main reason for a further reduction in the first half of the second period). In Russia, the reduction can be attributed to the overall reduction in grain area during the transformation period.

This adjustment of the barley sector resulted in constant per-capita consumption until 1986/1987, then in a considerable and continued cut-back until 1999, when per-capita consumption stabilized again, albeit at a much lower level.

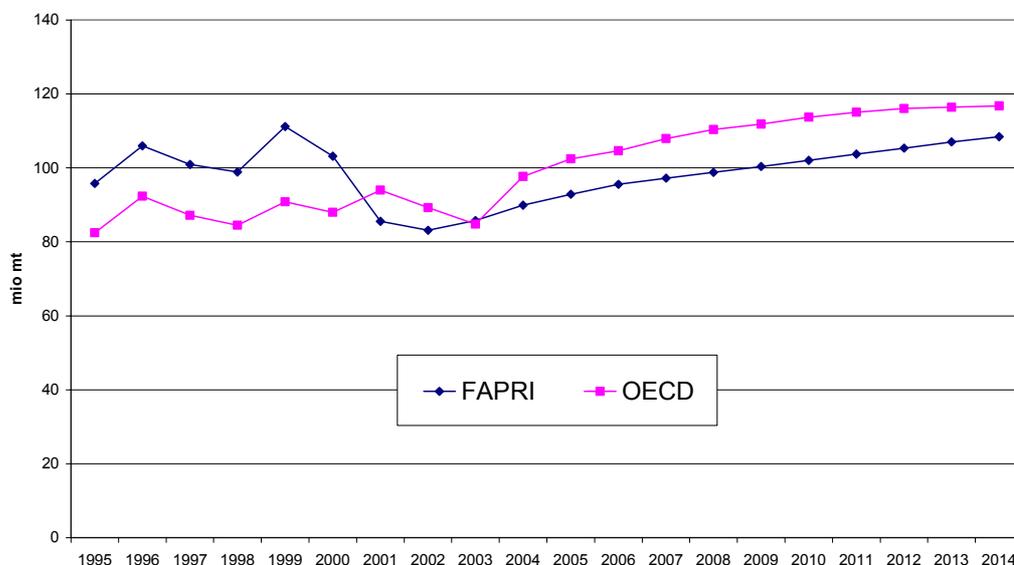
There is no clear trend for world **barley trade** either. It increased from about 13 mio mt in the early 1980s to almost 20 mio mt in the early 1990s and is now, after a roller-coaster ride in the middle of the 1990s, between 16 and 18 mio mt. The main exporters are EU-15, Russia, Ukraine, Australia and Canada.

### *Outlook 2005-2014*

### **Wheat**

The outlook is based on the most recent forecasts of two independent international institutions – FAPRI and OECD-FAO. Some similarities are obvious between the two forecasts for world wheat markets. Both forecasts agree that **world wheat trade** will grow faster than both production and consumption, and thus the share of wheat traded over the next decade (2005-2014) will increase. Wheat trade will grow by 1.7 % p.a. or 16 mio mt (according to FAPRI 2005) or by 1.5 % p.a. (14 mio mt) in total according to the OECD (2005).

**Graph 3.6 Wheat trade projections, 1995-2014**



Where the two forecasts differ to some extent is in the expected increase in **consumption and production**. Whereas FAPRI assumes a continued weak growth of 0.7 % for production and 0.8 % for consumption over the 2005-2014 period, OECD forecasts the world wheat sector will be substantially more dynamic (1.3 and 1.2 % respectively).

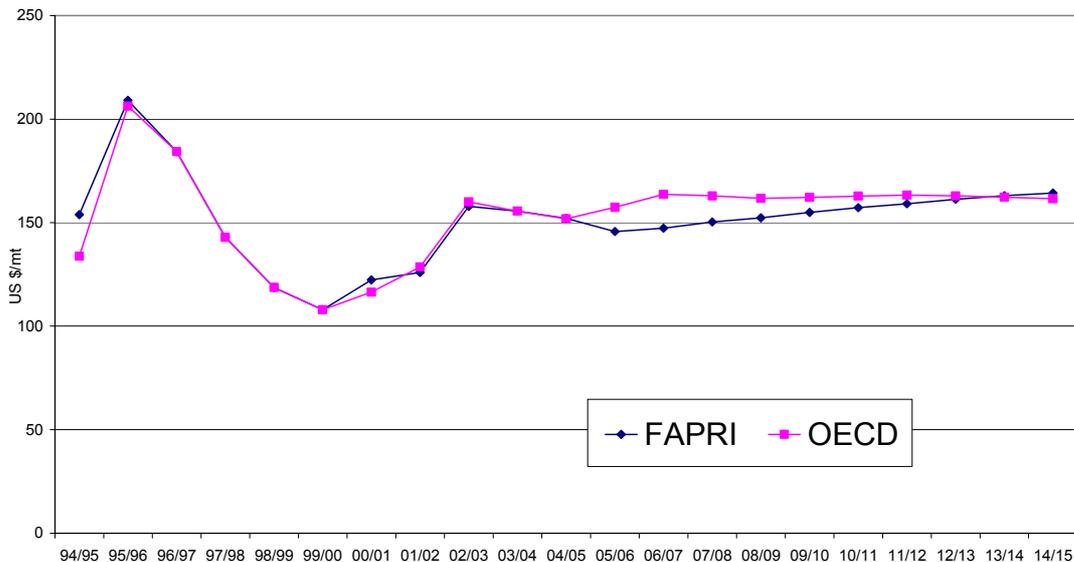
**Table 3.5 Outlook for world wheat markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 78                | 76                 | 83             |
| 1990/92 (FAOSTAT)  | 97                | 94                 | 93             |
| 2000/02            | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | <b>115</b>        | <b>109</b>         | <b>127</b>     |
| 2010/12 (FAPRI)    | <b>111</b>        | <b>108</b>         | <b>114</b>     |

Therefore, it can be concluded that both forecasts agree that, within the cereals aggregate, the wheat sector will see a less dynamic performance than the coarse grains sector in coming years.

**Price prospects** for wheat at the end of the coming decade are slightly higher than those of the recent past in both forecasts, though the paths differ. The OECD's projections exhibit a more pronounced increase in the near future followed by a very slight but steady decrease, whereas FAPRI's drops at the beginning of the forecast period and then increases steadily until 2014.

**Graph 3.7 Wheat price projections, 1994-2014**



*Wheat trade: selected countries*

Whereas OECD sees US wheat exports reaching 33 mio mt in 2014 (up from 25.5 mio mt in 2004/2005), FAPRI is much more pessimistic and foresees stepping up its exports only very slightly to 26 mio mt.

If the latter projection for the USA proves to be closer to reality, this would imply that **Australia** will become almost as important a player in the world wheat market by 2014. Both, the OECD and FAPRI foresee Australia's wheat surplus rising to 22-23 mio mt in 2014, up from 18-19 mio mt in 2004/2005.

**Canada**, recently overtaken by Australia, is not expected to keep pace with the export growth of either Australia or Argentina (the fourth major wheat exporter), although it is expected to step up its exports marginally from the current 16-17 mio mt to about 18 mio mt in the near future.

**Argentina's** wheat exports, on the other hand, are projected to rise comparatively steeply, from 9-10 mio mt in 2004/2005 to 14-15 mio mt in 2014/2015, bringing it closer to Canada in terms of exportable wheat surplus. The export quantities projected for 2014 are quite similar, but the paths of adjustment are different in the two forecasts: the FAPRI model foresees a rather large increase in exports in the near future followed by a subsequent slower growth, whereas OECD foresees a steady, robust growth from 2005-2014.

Half of this increase in Argentina's wheat exports could be absorbed by **Brazil's** import demand, which is projected to increase from 4.8 mio mt (2004/2005) to 6.8 mio t in 2014/2015 according to FAPRI, or from 4.5 mio mt to 7.7 mio mt according to OECD.

Forecasts for the **EU's** export potential are similar. Both the OECD and FAPRI forecast wheat net exports in the range of 10-12 mio mt over the entire period, although the latter's differs in that it anticipates a steadily growing export surplus (+ 2 mio mt over ten years), at least for the EU-15.

Although **Russia** became a wheat net exporter only four years ago, both institutions foresee it establishing itself as a persistent wheat exporter. In 2014/2015, the OECD believes Russia could be exporting about 7-8 mio mt (up from 4.5 mio mt in 2004/2005), and FAPRI between 5 and 6 mio mt. OECD's projection is that this increase will take place rapidly, over the next couple of years, while FAPRI foresees a slow and steady increase over the whole period.

Only FAPRI publishes separate estimates for **Ukraine and other Eastern European countries**. These two data series were aggregated in order to make them comparable to the OECD's "Other Europe" aggregate. Ukraine's wheat exports are expected to follow a similar pattern to that of Russia, although on a lower level: OECD projects its exports to increase from the current 4 mio mt to 5.5 mio mt in 2009/2010, dropping back to 4 mio mt in 2014. FAPRI's forecast is once again rather "flat" and remains within the 3-4 mio mt-range.

Both forecasts agree that **India** will remain a minor wheat net-exporting country (current exports of 1-1.5 mio mt), although the OECD calculates that it will be increasingly difficult for India to maintain this status, and expects it to reduce exports to almost zero by 2014. FAPRI on the other hand foresees an increase in exports in the latter part of the period.

**China's** wheat net imports are expected to remain at about 7 mio mt per year over the whole period (FAPRI), or 8.6 mio mt according to the OECD, though they expect this to fall to around 7 mio mt by 2014. In any case, imports will be bound most of the time by the 9.6 mio mt WTO import quota. (The two forecasts differ on the quantities likely to be exported at the same time).

**Mexico** is likely to step up its wheat imports from its current level of 3.3-3.6 mio mt to 4.6 mio mt (FAPRI) or even 5.5 mio mt (OECD) 2014.

## Coarse Grains

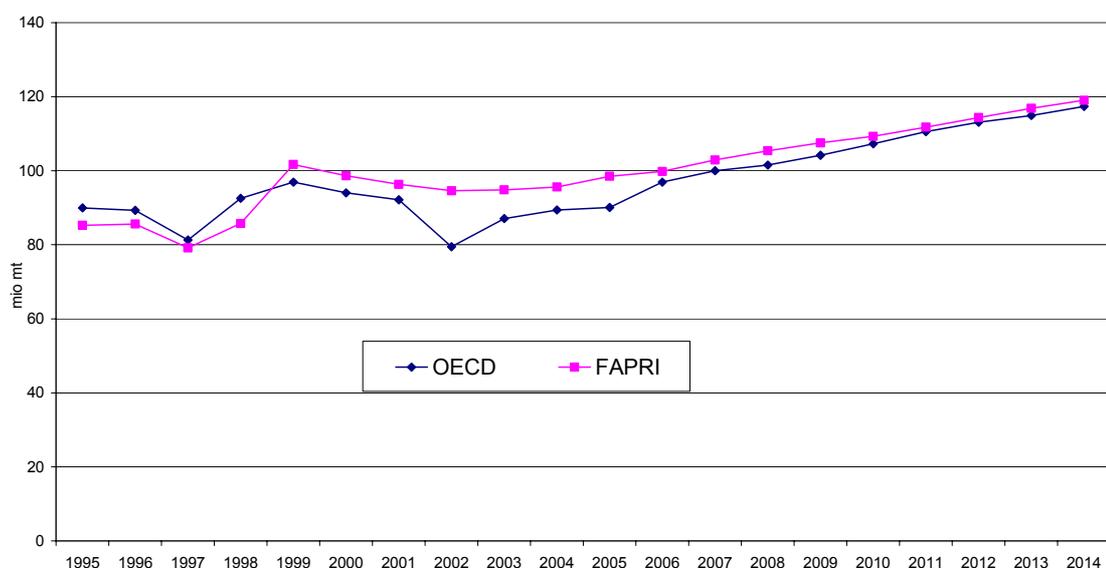
Before comparing the forecasts for coarse grains it should be noted that OECD's coarse grains aggregate is more comprehensive than FAPRI's. Here, for the purpose of comparison, three FAPRI data series (maize, sorghum, barley) were added in order to obtain a proxy for its implicit coarse grain projections.

As is the case for wheat, OECD forecasts world coarse grains **consumption and production** to grow more significantly in the forecast period (up 1.4 % p.a. for consumption and 1.5 % for production than FAPRI (1.2 % and 1.1 %, respectively). According to OECD, world coarse grain **trade** could post a strong 3.0 % annual increase (27 mio mt in total) over the coming decade, compared to FAPRI's 2.1 % (21 mio mt).

**Table 3.6 Outlook for world coarse grains markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 85                |                    |                |
| 1990/92 (FAOSTAT)  | 95                |                    | 93             |
| 2000/02            | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | <b>120</b>        | <b>118</b>         | <b>125</b>     |
| 2010/12 (FAPRI)    | <b>120</b>        | <b>117</b>         | <b>116</b>     |

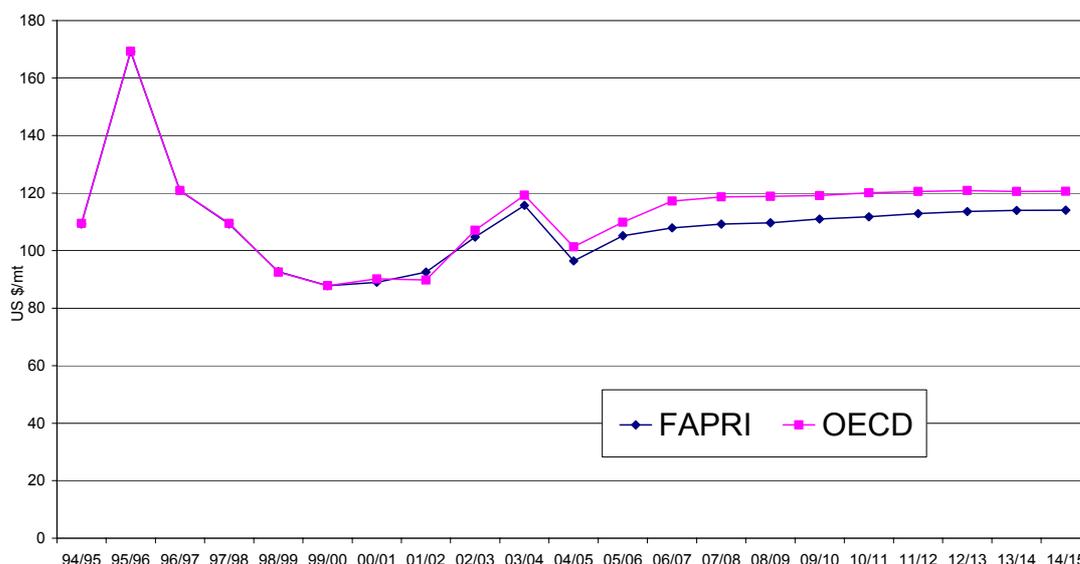
**Graph 3.8 Coarse grain trade projections, 1995-2014**



Both projections therefore agree that within the cereals aggregate, it is the coarse grain sector that will continue to be the more dynamic one.

Similarly, no spectacular changes in **world market prices** for coarse grains are expected. According to both forecasts, nominal maize prices could increase slightly to about 120 US\$/t, with the OECD projecting a more rapid increase in the near future and a subsequent stagnation and FAPRI a steady increase over the projection period.

**Graph 3.9 Maize price, 1994-2014**



*Coarse grain trade: selected countries*

Both forecasts agree that the **USA** will continue to be the world’s biggest coarse grain exporter and is likely to increase its exports considerably, though they differ on the exact amount. OECD forecasts US coarse grains net trade to stand at 66 mio mt at the end of the forecast period, almost 10 mio mt lower than FAPRI’s predicted 75 mio mt.

**Argentina** will likely net-export about 15-16 mio mt in ten years and establish itself as the world’s second largest coarse grain exporter, according to both projections, although the paths projected to attain this level differ significantly. Whereas FAPRI calculates a rapid increase in exports until 2006 and a subsequent stagnation, the OECD model anticipates instead a more steady growth over the whole.

To ascertain Latin America’s trade surplus in coarse grains to other regions, the projections for Argentina and **Brazil** have to be combined. What is confusing here is the fact that OECD and FAPRI have completely different views not only on Brazil’s future trade status but also on past net trade. Whereas FAPRI follows Brazil’s official statistics and has viewed Brazil as a net exporting country since 2000, OECD continues to register Brazil as a net importing country. Consequently, the forecasts also diverge as both predict a continuation of the “status quo”. The resulting gap is as large as 3 mio mt, which generates big differences in Latin America’s projected coarse grain surpluses.

**Australia**, a smaller coarse grain exporter, could increase its surplus from 4-5 mio mt to 5-6 mio mt, with the OECD the more optimistic of the two.

**South Africa**'s coarse grains surplus could amount to about 1 mio mt by 2014, an increase of roughly 0.5 mio mt according to FAPRI or 1.0 mio mt in OECD estimations.

**Canada**, though a major player in the world wheat market is, in terms of coarse grain trading, of minor importance. OECD expects Canada to remain a small coarse grain net-exporter; although it imports maize from the USA, it exports more "other coarse grains" (FAPRI's figures on Canada are lower throughout the whole period as the aggregate only considers Canada's barley exports).

An interesting region in terms of coarse grain net-exports is the Black Sea area. Unfortunately, only FAPRI publishes estimates for Ukraine. Thus, FAPRI's figures on **Ukraine** and on **other Eastern Europe** were aggregated in order to make them comparable to OECD's "Other Europe" aggregate. Both projections agree that non-EU-25 European countries, excluding Russia, of which Ukraine is the largest, will at least consolidate their position as a net coarse grain exporting region at just below 7 mio mt (FAPRI), if not increase their exports further to about 8.5 mio mt (OECD).

Projections on **Russia** are provided by both institutions, but they differ on Russia's future net-trading status: on the one hand, OECD expects Russia to be a net coarse grains importer at the end of the next decade Russia (by about 1.5 mio mt), whereas FAPRI expects it to be a net-exporter (by about 2 mio mt). In the end this comes down to the problem of predicting whether Russia will import more or less maize than it will export barley.

As Ukraine will continue to offer the cheapest origin of maize to Russia, it is important to look on the **Black Sea region as a whole**. In this context, the differences between the two forecasts are less pronounced as FAPRI's lower estimate for "Ukraine + other Eastern Europe" is countered by their view of Russia as a net-exporting country and OECD's higher forecast for "Other Europe" exports is balanced by the fact that it expects Russia to be a net-importer. In terms of the final result therefore, the two projections for the Black Sea region as a whole seem to be reasonably close to each other, and the most important point is that both forecasts see the Black Sea region as a major exporter of coarse grains, with an increasing potential trade surplus, as compared to that of the EU-25 (OECD estimate).

The two projections on **China**'s coarse grain net-trade essentially reach the same conclusion. China has been a large coarse grain net-exporter in the recent past reaching its export peak in 2002 with 13.5 mio mt, dumping surplus maize onto the Asian market. Both forecasting institutions expect China to become a major coarse grain importer very soon. According to OECD, net-imports could stabilize at about 5 mio mt, while FAPRI projects the import deficit to increase to 8 mio mt until 2014.

The projections on **EU** coarse grain net-exports differ substantially. The difference can only to a small extent be explained by the different aggregation of coarse grains (FAPRI coarse grains do not contain rye and oats). There are clearly two completely different views on the EU's capacity to export coarse grains: OECD, on the one hand, predicts the net-export potential of the EU-25 to be in the range of 8-10 mio

mt, whereas FAPRI, on the other hand, expects combined net-exports of the EU-15 and the EU New Members' not to exceed the 3 mio mt mark. If one takes into account that a considerable part of the trade is between the EU 15 and the New Member States, the calculated difference is even more striking.

**Japan**, the most important coarse grain importing country, is projected to reduce coarse grain imports from its current level of 19 mio mt to 18.5 mio mt (FAPRI) or from 21 mio mt to 20 mio mt (OECD) in 2014. **South Korea** however, is expected to increase imports further from 8.5 to 10.5 mio mt (FAPRI) or from 9.8 to 10.3 mio mt (OECD). For both countries, OECD's forecasts are the more conservative.

**Mexico**'s coarse grains imports could rise steeply from current levels of just below 10 mio mt to about 14 mio mt according to FAPRI. The OECD expects imports to peak at 12 mio mt in 2008-2010 and then fall back.

**India** is expected to continue playing a minor role in world coarse grain trade. OECD foresees annual exports standing at 0.7 mio mt throughout the forecast period, FAPRI predicts lower and declining exports.

#### 4. RICE

Although a major grain, **rice** receives less attention in world markets because trade represents a small share of world production. The main producing and consuming countries are in one region: Asia. Small changes in the domestic situation of these countries, including adjustments in policy, can have a significant impact on trade and prices. Production and trade are forecast to grow to meet the increasing demand, i.e. they will be driven by population growth.

*Developments since 1980<sup>1</sup>*

**Table 4.1 Evolution of world rice markets (mio mt)**

|         | <b>Production<br/>(Paddy)</b> | <b>Consumption<br/>(Paddy)</b> | <b>Exports<br/>(Milled)</b> |
|---------|-------------------------------|--------------------------------|-----------------------------|
| 1980/82 | 410                           | 407                            | 12                          |
| 1990/92 | 522                           | 521                            | 13                          |
| 2000/02 | 592                           | 584                            | 25                          |

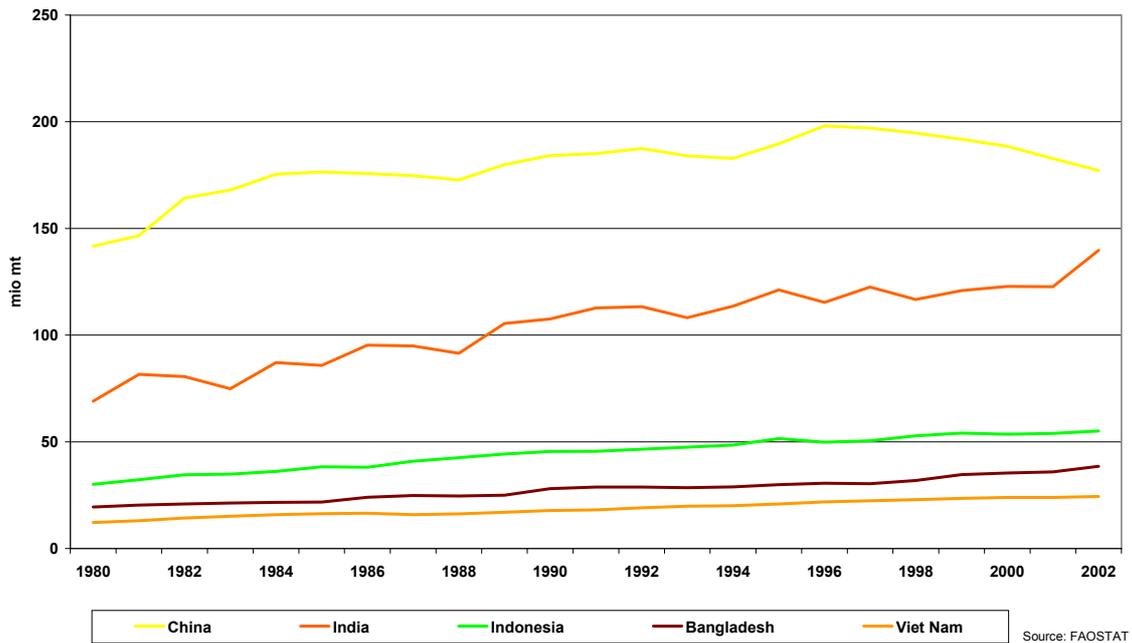
On average for the years 2000 to 2002 world rice production came close to 600 mio mt (paddy, close to 400 mio mt in milled equivalent), while consumption was slightly lower. Both production and consumption have increased by 40 % since the early eighties. Trade was stable up to the 1990s and doubled over the next ten years.

The large gap between Asia and rest of the world is marked by differences in per capita consumption; 140 kg per capita in Asia, 20 kg per capita in the US, less than 10 kg per capita in the EU.

Annual growth in **consumption** declined from 2.7 % between 1980 and 1992 to only 1.2 % recently, a slowdown observed in each continent. In Asia, where the biggest consumers (China, India, Indonesia) are located, growth is below the world average. In China and Thailand, consumption, both total and per capita, declined, but consumption is still increasing in India (2.1 % p.a.) and Indonesia (1.7 % p.a.). Africa still exhibits significant annual consumption growth of 3 %, but when adjusted for population, its per capita consumption growth is only 0.5 % p.a. In Latin America, stability in Brazil determines the overall trend, while in North America, per capita use increases, but at a lower pace since 1992. Finally, in the EU, total and per capita use grew at 2 % annually between 1992 and 2002.

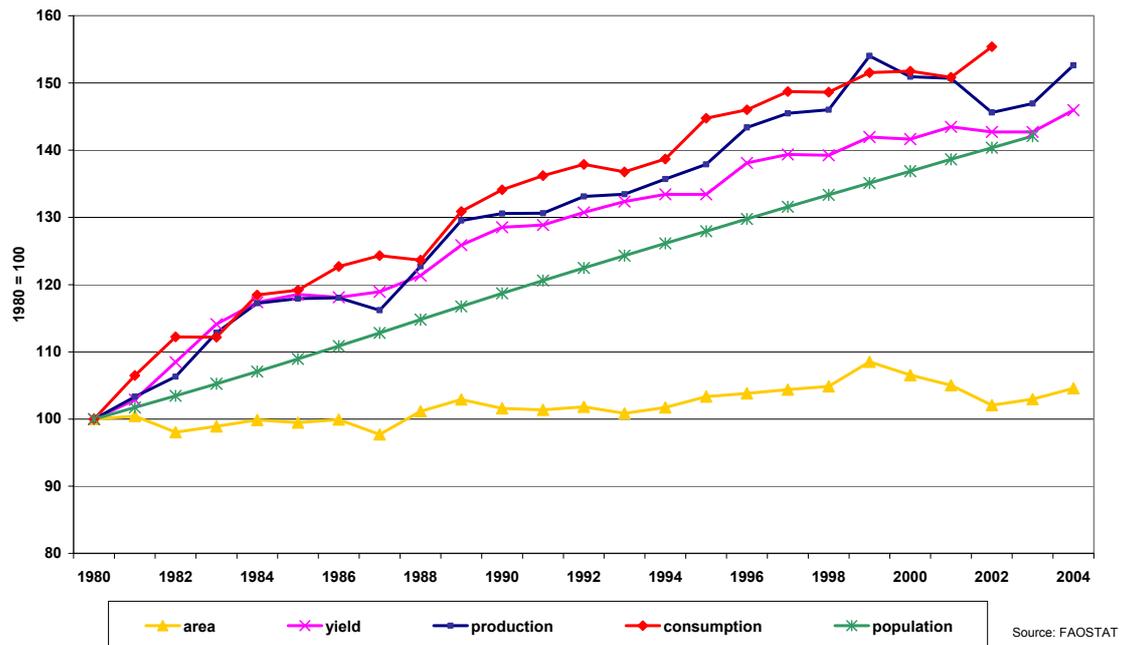
<sup>1</sup> Figures for areas, production and consumption refer to paddy rice (rice in the husk). Figures for trade and outlook are expressed in milled equivalent (white rice).

**Graph 4.1 Rice consumption 1980-2002, main rice consumers**



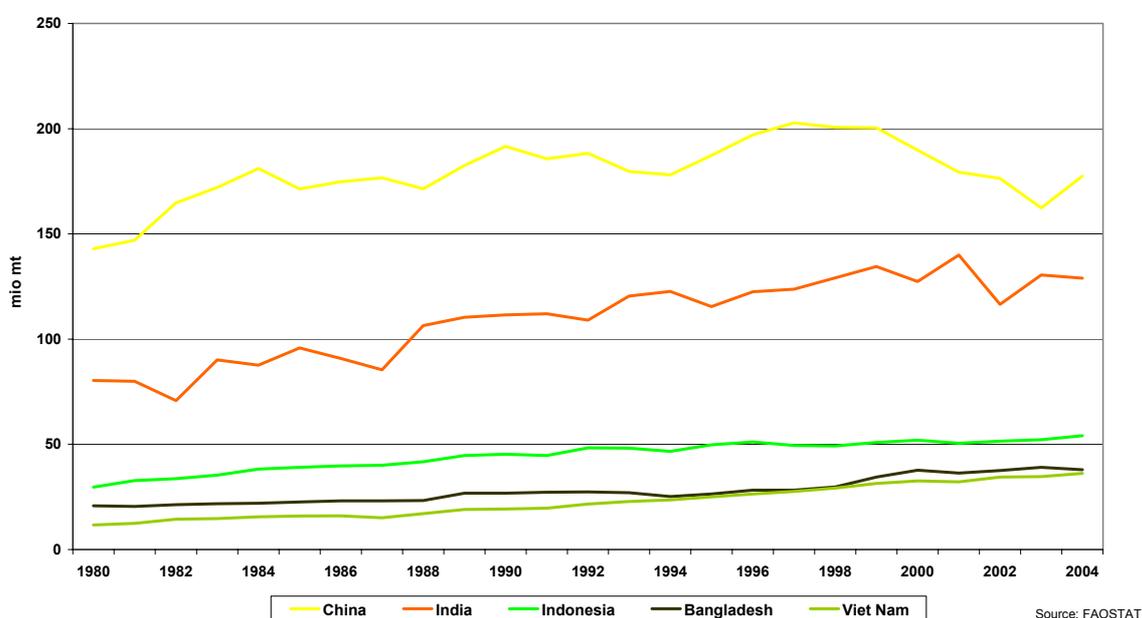
In rice, leading consumers are also leading producers (same top 5 countries in both categories). Globally, **production** is characterised by the same annual growth profile as consumption, but at a slightly lower pace; a slowdown from 2.4 % over 1980-1992 to 1.1 % recently. The increase in production is the result of improvements in yields, especially between 1980 and 1992; area remained stable over that period and has significantly declined since 2000.

**Graph 4.2 World rice growth, 1980-2004**



Contrasting developments are observed among the leading world producers: sustained annual growth in Thailand, modest increase in India and Indonesia, and a decrease in China (as a result of a reduction in areas) and Japan. In Africa, annual production still grows by 3 %, but yields have not improved since 1992. In Latin America, Brazil achieved a stronger annual growth rate in 1992-2004 than over the 12 previous years, both in production and yields, despite a decline in area since 1980. In the US, annual production growth slightly increased in the 1992-2004 period compared to the previous 12 years, mainly as a result of enhanced growth in yields since 1998. In the EU, on the other hand, the annual rate of growth fell below 2 %.

**Graph 4.3 Rice production 1980-2004, main rice producers**



**Trade** significantly increased in the mid 1990s and has expanded even further in recent years. Still, this only represents 7 % of production as production more or less matches consumption in the top 5 countries.

On the **export** side, Asia is dominating, but the US is also a significant exporter. Thailand brought its exports up to a record 10 mio mt (milled) in 2003, reinforcing its position as leading exporter. India and Vietnam became net exporters in the late 1980s/early 1990s. Yet, while Indian exports fluctuate between 1 and 6 mio mt, Vietnam reached 4 mio mt in recent years. China became a significant net exporter of 2 to 3 mio mt after 1997, but its exports have recently dropped to minor levels. U.S exports remained stable at around 3 mio mt, as did those of Pakistan at around 2 mio mt.

On the **import** side, only one of the top-5 importers is not in Asia (Nigeria). There are more players than on the export side and there have been several changes in the ranking of the top importers. Indonesia has been the leading importer for some years, but its imports are extremely variable, oscillating between 0.7 mio and 6 mio

mt during the last decade. The imports of Bangladesh have also fluctuated between 0 and 2.5 mio mt. As these countries are leading producers and consumers, small relative changes in their domestic situation translate into significant variations in world imports. Nigerian imports have been steadily rising since the mid 1990s, approaching 2 mio mt. As a result Nigeria has now overtaken the Philippines as the second world importer. Saudi Arabia, Iraq and Iran imported the same amount of rice in recent years, close to 1 mio mt.

*Outlook 2005-2014*

**Table 4.2 Outlook for world rice markets**

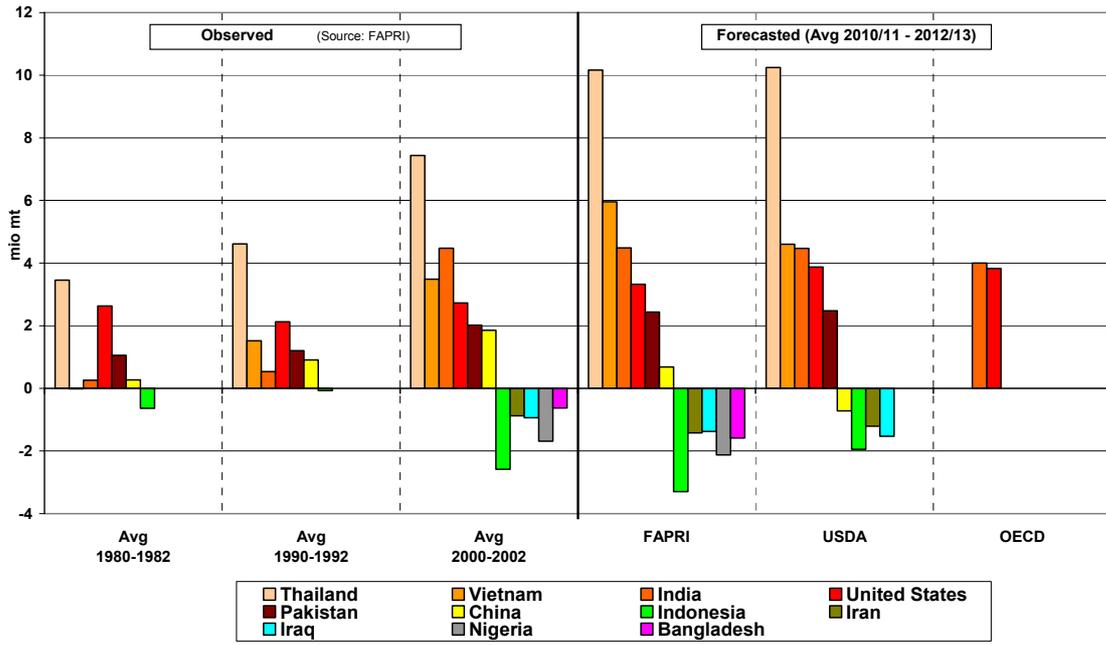
| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 69                | 70                 | 48             |
| 1990/92 (FAOSTAT)  | 88                | 89                 | 52             |
| 2000/02            | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | <b>114</b>        | <b>110</b>         | -              |
| 2010/12 (FAPRI)    | <b>111</b>        | <b>108</b>         | <b>123</b>     |

FAPRI and OECD consider that the recent decline in rice per capita **consumption** will continue over the medium term, driven by urbanisation, income growth and diversification of diets in Asian countries. However, overall consumption would still increase, as a result of population growth. After the drop in early 2000, production has recovered. **Production and trade** are expected to grow further to meet rising demand. After the variations observed since 2000, stock-to-use rates are forecast to stabilise at normal rates (close to 20 %). Therefore, both OECD and FAPRI project an increase in world prices for rice, including in real terms.

Thailand and Vietnam are forecasted to go on enhancing their **exports**, while India is expected to resume growth. The U.S and Pakistan would remain close to their current export level. FAPRI expects China to remain a net exporter, however, it considers that it is not likely to reach the level of exports achieved in the late 1990s again. In contrast, USDA and OECD see China as a net importer.

On the **import** side, FAPRI estimates that Indonesian imports will come close to 4 mio mt at the end of the projection period. Nigerian imports are expected to resume growth, and Bangladesh to show a steady increase, with both countries reaching import levels above 2 mio mt at the end of the projection period. Philippines and the above three Middle East importers are each forecast to import more than 1.5 mio mt by 2014. EU imports are projected to increase up to 1 mio mt, as a combined result of the 2003 reform of the rice regime and the full implementation of the Everything but Arms agreement (duty and quota free imports from least developed countries).

**Graph 4.4 Evolution in net trade, rice (net exporters and net importers)**



## 5. OILSEEDS CROPS

### 5.1. Oilseeds

World **oilseed** production and consumption has grown at robust rates in the last quarter of a century and, although this growth rate could drop somewhat in the next 10 years, it is nevertheless expected to remain double that of cereals. In order to bring demand and production into balance nominal oilseed prices could rise modestly. Brazil will overtake the USA as the most important oilseed exporter. China could double its imports and, therefore, absorb almost half of the oilseeds traded in 2014/2015. The EU will remain the second major importer.

The oilseed sector is in many ways dependent on developments in other agricultural or even non-agricultural markets. First of all, oilcrops compete with other crops for limited acreage. As most of the demand for oilseeds is for its various crushed forms (vegetable oils and oilmeals) rather than for direct food or feed use, there are a lot of cross-market influences: oilmeals as protein-rich feedstuffs for animals compete with by-products from the grain-processing industry, protein crops/pulses and with animal and fishmeal; vegetable oils compete with animal fats and, to a small extent, with mineral oil and other energy sources like ethanol.

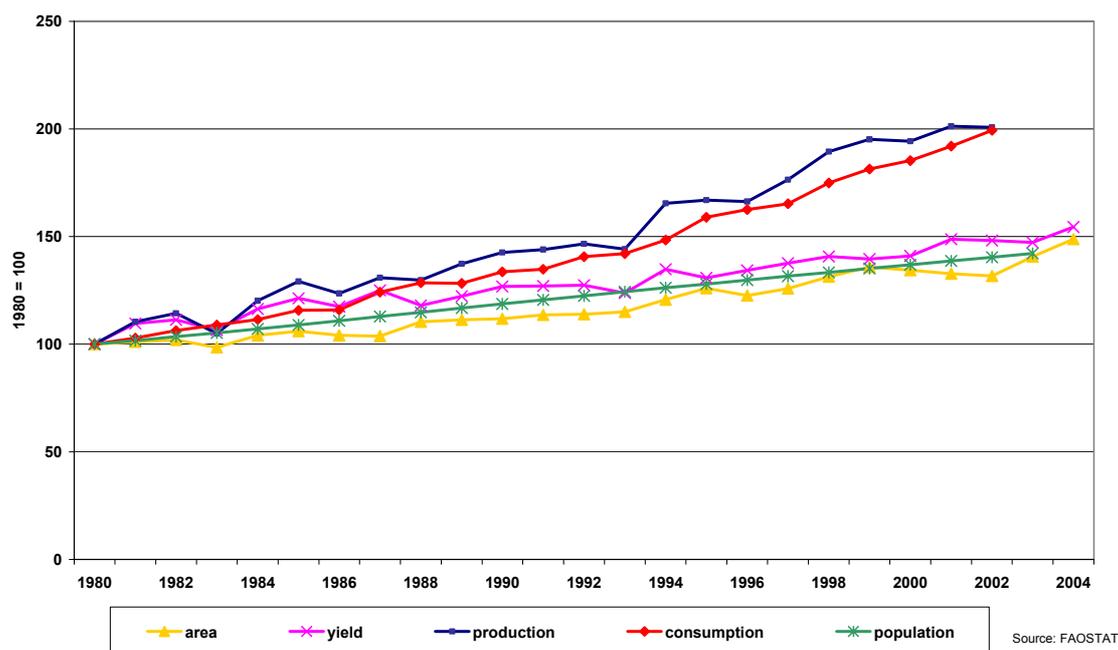
*Developments since 1980*

**Table 5.1 Evolution of world oilseeds markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 166               | 167                | 31             |
| 1990/1992 | 221               | 221                | 34             |
| 2000/2002 | 304               | 311                | 66             |

Driven by the increasing demand (+ 3.2 % p.a.) which resulted from population growth and rising per capita income, the oilseed sector (aggregate without oil palms) has shown robust growth rates over the last quarter of a century (see graph 5.1). Until now, there are no signs of a slow-down. Data even indicates an acceleration in **consumption** growth in the second half of the period under consideration: from 2.9 % in 1980-1992 to 3.6 % in 1992-2004.

**Graph 5.1 World oilseeds crops trends, 1980-2004**



On a regional level, the highest growth rates were observed in Latin America and Asia, but while Asia’s increase in consumption slowed down slightly, Latin America’s accelerated from the first to the second split period. As consumption increased faster than the world population, **per capita-consumption** increased substantially from 1980-2002.

**Production** has followed consumption; the increase in production (+ 3.2 % p.a.) was rendered possible through higher productivity and an increase in acreage. The acreage necessary for the increase in oilseed production was a result of the reduction in cereal (and other crop) acreage and, especially in South America, and of the expansion of agricultural land through cultivation. There is a noticeable shift in the reasons for growing production: whereas improvements in yields were largely responsible in the first half of the period (1980-1992: + 2.0 % p.a.), expansion of acreage was the major driving force in the second half (1992-2004: + 2.3 % p.a.). This is partly related to technological change in the plant breeding sector: in the first decade, efforts still concentrated on improving yields through “classical” breeding, whereas since the mid-1990s the focus has shifted towards gene-technology which aims at reducing costs. Regionally, production grew particularly fast in Latin America and Oceania, but Europe also experienced an above average increase. Asia and Africa saw their production grow slower than their consumption.

Inside, the oilseed sector is heterogeneous. On the one hand, there are oilseeds (rapeseed/canola, sunflowerseeds) which have a high oil content, which make them the preferred option where oil is valued more highly than meal, on the other hand there are soybeans which are sought after principally for their meal. In the following text past developments for three major oilseeds are analysed in more detail.

## Soybeans

With normal levels of production and consumption currently about 200 mio mt, soybeans are by far the most important oilcrop. Demand for soybeans is principally for the processed product. Normally, demand is focussed on the main product of the soybean crushing industry, which is the high-value soybean meal. (With the current very high prices for vegetable oils, however, almost half of the value comes from the oil).

**Table 5.2 Evolution of world soybeans markets (mio mt)**

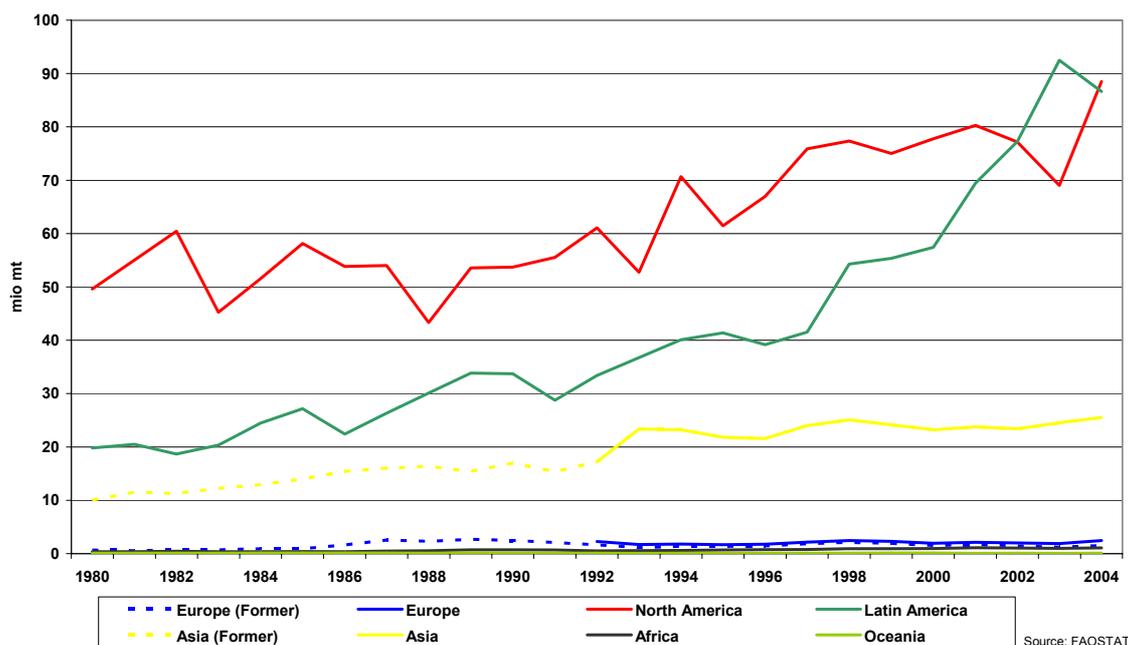
|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 87                | 87                 | 27             |
| 1990/1992 | 109               | 109                | 27             |
| 2000/2002 | 173               | 175                | 51             |

During the last quarter of a century **demand** for soybeans has been growing at a comparatively strong pace (3.6 % p.a.), stronger than the rate for all oilcrops excl. oil palms. A very pronounced acceleration in growth of demand is observed from the first to the second split period: from 2.3 % p.a. in 1980-1992 to 5.2 % p.a. in 1992-2002. Until the early 1990s, soybean demand roughly mirrored the increase in population, thus meaning that per capita-consumption remained more or less unchanged. Since then the picture has changed completely: consumption growth outpaced that of population by far and **per capita consumption** of soybeans rose steeply in 1992-2002. Regionally, this increase was driven mainly by Latin America, Asia and North America. In 1980, consumption in Asia and South America was comparable to that in Europe and at about half that of North America. Meanwhile, both Asia and South America have overtaken North America.

Driven by demand, soybean **production** increased by almost 4 % annually over the 1980-2004 period. In absolute terms, production more than doubled in 25 years. Increases in area planted (2.5 % p.a.) and to a lesser extent in yields (1.4 % p.a.) contributed to this robust growth. Whereas the yield growth decelerated in the second half of the period under consideration, expansion of area more than outweighed this slowdown, driving growth of production to 5.0 % p.a. in 1992-2004.

In the early 1980s, North America accounted for roughly two thirds of world production, the remaining one third taking place in South America and Asia. This picture has completely changed. In most recent years Latin America and North America have shown similar levels in world production and Asia is far behind with about one tenth of global production (see graph 5.2). Growth rate of production in South America has been more than double that of North America throughout the period under consideration and both continents show a strong acceleration in the rate of expansion from the first sub-period to the second.

**Graph 5.2 Soybeans production 1980-2004, main regions**



There are three major soybean producing (and exporting) countries with the following actual production potential (average 2002-2004): USA 78-80 mio t or 40 % of world production, Brazil 48 mio t or 25 %, Argentina 32 mio t or 17 %. Given this geographical concentration it is not surprising that **world soybean trade** as a percentage of world soybean consumption is much higher than for grains. World soybean trade stands now at more than 60 mio mt, double that of ten years ago, and accounts for an average of over 30 % of world consumption.

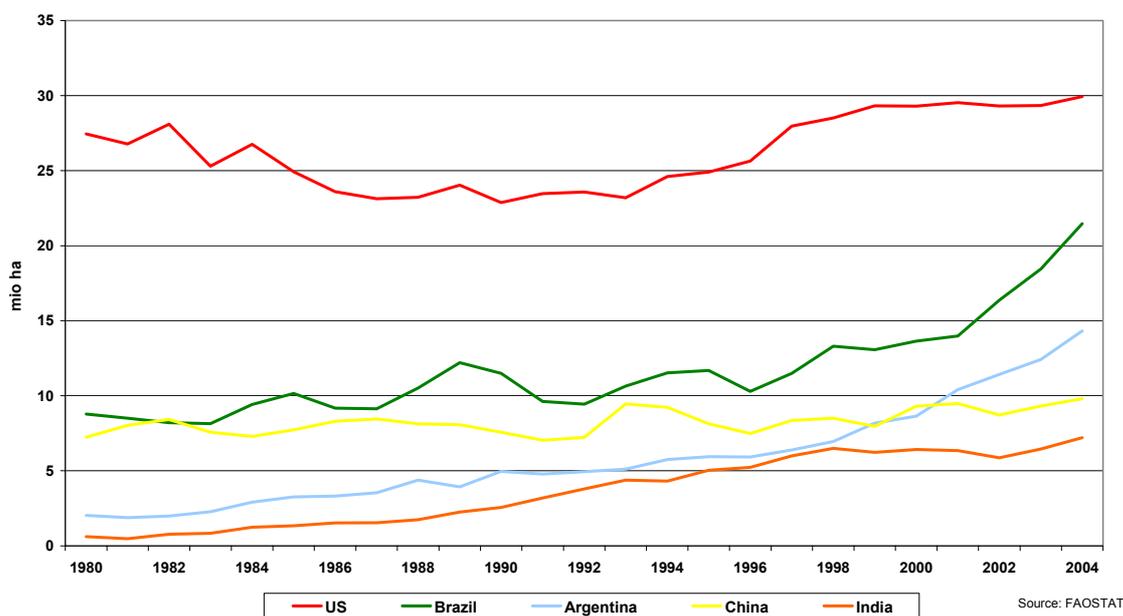
**USA:** After shrinking from 27-28 mio ha in the early 1980s, soybean area stagnated at about 23 mio ha between 1986 and 1993. Subsequently, acreage increased, but has stabilized at just above 29 mio ha since then. Combined with yield improvements, this contributed to an increase in production from about 60 mio mt ten years ago to close to 80 mio mt today. For several years, soybean consumption has stood at about 50 mio mt and exports are oscillating between 27-30 mio mt. The share of GM-soybeans in production is currently about 80-90 %.

**Argentina:** Soybean area has seen a very strong increase. Acreage is now close to 15 mio ha whereas 10 years ago, it was just under 6 mio ha. As a result, production grew from 12 to 32 mio mt over the same period. Almost all the soybeans produced are GMO. As the crushing capacity did not keep pace with production growth, the share of soybean exports in total production has risen to about one quarter. However, investments in the crushing industry continue to be strong and the export tax system favours the export of the soybean products over beans, so this share is likely to decline again in the future.

**Brazil's** soybean area increased at a robust pace until the end of the 1990s, but since then acreage has literally exploded from 13-14 mio ha to 22 mio ha in 2004 (graph 5.3). Production increased accordingly from 30 mio mt to about 50 mio mt. Apart from this sharp increase in production there has been another major change: a geographical shift in production towards the North. This created a need for improving the infrastructure to transport exports from these regions. Investments are

focused on lowering the costs of exporting soybeans through northern ports. Due to the strong demand for soybean meal from the livestock sector, Brazilian soybean consumption also grew fast, at 5 % p.a. in 1992-2002, more than double that of the 1980-1992 period. In 2002, Brazil's soybean consumption was estimated at 27 mio mt. Unlike the other two main exporters, Brazil allowed production of GM-soybeans only recently and in the last crop, its GM share was thus estimated at only one third of total production. This makes it the only major origin of non-GM soybeans, a commodity which is trading at a premium in the EU and Japan. But as more producers will plant GM soybeans it becomes more difficult and expensive for exporters to source non-GM soybeans.

**Graph 5.3 Soybeans area 1980-2004, some selected countries**



Recently, **China** has become the largest soybean importer. The rapid increase in domestic demand for soybeans in China has resulted in an increase in imports from almost zero ten years ago to over 20 mio mt in 2004. Brazilian and Argentine exports to China have increased from 0.5 mio mt in 1996 to 8.7 mio mt in 2003.

Formerly the number one importer, the EU-15 imports about 17-18 mio mt and Japan roughly 5 mio mt annually. The fourth important importer is Mexico which absorbs more than 4 mio mt.

### Rapeseed

With more than 40 mio mt, rapeseed/canola occupies about 12 % of world oilseed consumption. Second only to soybeans, rapeseed has become the leader for the rest of the oilseed sector. Rapeseed's success story began initially with the arrival of the so-called "0-varieties" (no erucic acid) in the 1970s and then, about ten years later, of the "00-varieties" (which in addition drastically reduced the content of glucosinolates), which made rapeseed oil suitable for human consumption and the residual rapeseed meal a protein-rich feedstuff for animals.

Moreover, rapeseed cultivation has a positive effect on the crops following in rotation. In the case of wheat, the improved soil structure and nutrient residues can boost yields by up to one third.

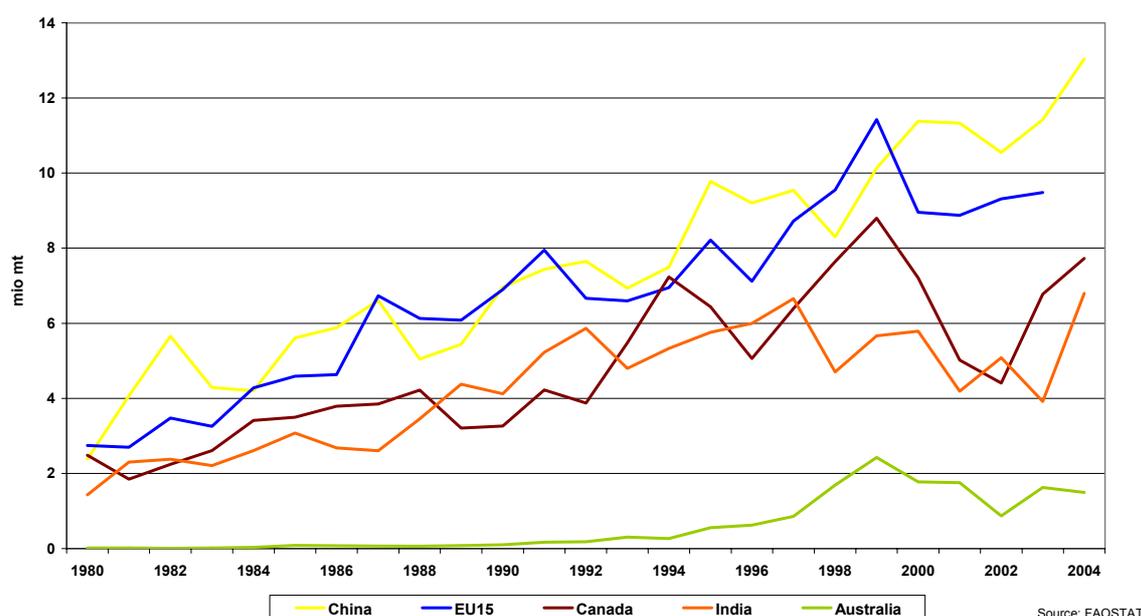
**Table 5.3 Evolution of world rapeseed markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 13                | 13                 | 1.2            |
| 1990/1992 | 26                | 27                 | 2.6            |
| 2000/2002 | 37                | 39                 | 6.7            |

Unlike soybeans, the demand for rapeseed is mainly (about 70 %) determined by the demand for rapeseed oil. Rapeseed **consumption** has exhibited an impressive growth rate over the last 25 years: 5.8 % p.a. Unlike soybeans however, a substantial slow-down in growth is observed between the first sub-period 1980-1992 (7.9 %) and the second 1992-2002 (3.2 %). As the increase in consumption outpaced that of population, world per capita consumption has been rising strongly. At regional level, Asia, and to a lesser extent Europe, was the main driving force behind global demand, but both continents had above-average growth rates.

Rapeseed **production** has grown in response to the strong increase in demand and has outpaced the growth of most other oilseeds. This is due to an impressive increase in productivity of 2.5 % over the whole 1980-2004 period. At the same time, rapeseed acreage had to be expanded to meet increasing demand. Whereas in the first split-period world acreage increased by 5.2 % annually, this rate fell to 2.3 % in the second, in order to adjust to the slow-down in demand. Most of this change can be attributed to the change in acreage in Asia, as European rapeseed acreage experienced a weaker, but steady growth.

**Graph 5.4 Rapeseed production 1980-2004, some selected countries**



World rapeseed **trade** is currently estimated at more than 5 mio mt. By far the most important exporter is Canada, followed by Australia. Japan, China, Pakistan and Bangladesh are the major importers. The EU changes net-trading status according to domestic production.

Canada's production grew at a strong pace, especially from 1992-2004, outpacing its increase in consumption by far. Thus the exportable surplus increased. The same holds true for Australia.

Herbicide-resistant GM canola is grown on about 80 % of the acreage in Canada. Although Australia's gene technology regulator has approved transgenic canola for commercial planting, state and territory legislators have established moratoriums prohibiting the growing of transgenic canola.

For China, production has not kept pace with growing consumption. India, another major rapeseed producing and consuming country, does not take part in world rapeseed trade. Japan has no production at all and has to import all it consumes.

### Sunflowerseed

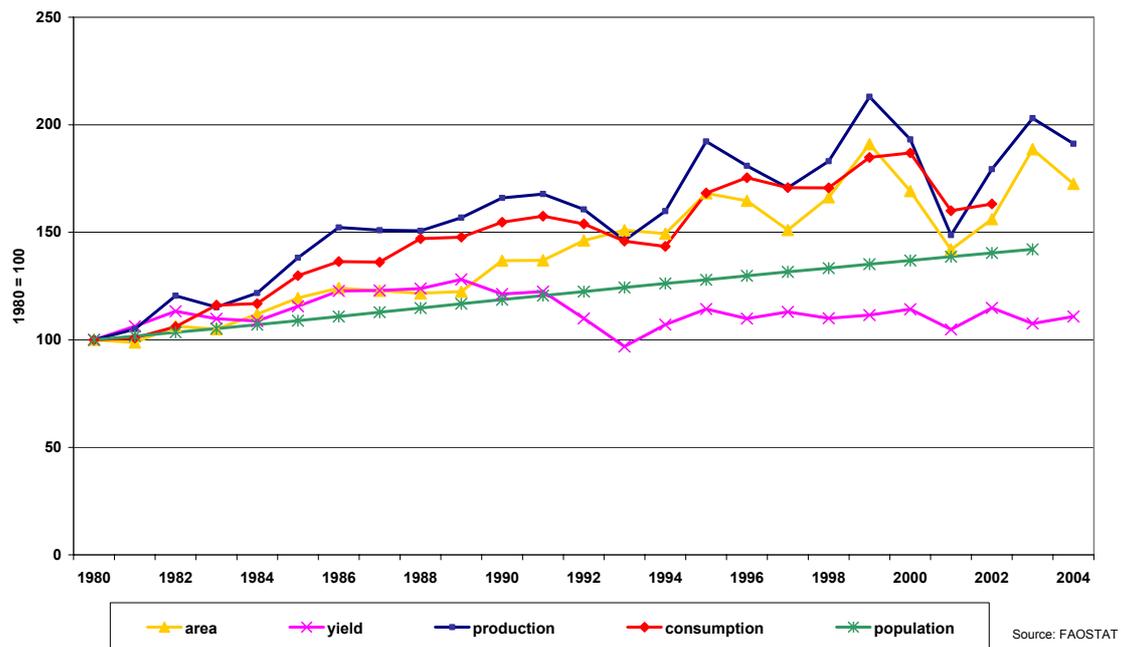
The sunflowerseed sector is highly unstable. This is in part due to the specific characteristics of production, which is in many places a residual production; spring sunflower seeding takes place when the weather does not permit the intended wheat planting or where wheat suffers from winterkill. Graph 5.5 also shows that, unlike the rest of the oilseed sector, sunflowerseed consumption not only follows production, there is a pronounced four-year cycle in both production and consumption. For these reasons, the split-trend analysis applied may not be totally adequate for this sector. In the second split-period (1992-2004) especially, no clear trend is evident.

**Table 5.4 Evolution of world sunflowerseed markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 15                | 15                 | 0.8            |
| 1990/1992 | 23                | 23                 | 1              |
| 2000/2002 | 24                | 25                 | 2.3            |

World sunflowerseed **consumption** stands at about 26 mio mt. Compared to the rest of the oilseed sector, the growth rate of 2.3 % p.a. over the last quarter of a century is rather weak. Having experienced a relatively high annual increase of 3.7 % between 1980 and 1992, the expansion of the sunflowerseed sector then came virtually to a halt in 1992-2002. Current **per capita consumption** is only slightly higher than in 1980. The turning point for sunflowerseed consumption and production took place between 1997 and 1999, after which there was a steep decline in consumption. This development occurred in all regions, but within Europe, consumption in Eastern Europe (Russia, Ukraine) still grew substantially from 1992 to 2002, whereas it declined significantly in the EU.

**Graph 5.5 World sunflowerseed growth, 1980-2004**



One reason for the lack of dynamics in the sunflowerseed sector is the disappointing development of yields which, having improved considerably in the 1980s, then dropped and has seemingly stagnated at a level close to that of almost 25 years ago. Consequently, sunflowerseed production lost its competitive margin in comparison to other crops. Acreage increased steadily from 1980 to 1992 by 3.2 % annually and then entered a four-year cycle in which the upward trend was weak, if at all.

Sunflowerseed trade is marginal and accounts for less than one tenth of world production and consumption.

**Argentina:** After a peak in production in the late nineties, when production reached more than 7 mio mt, current annual production is in the range of 3.5 to 4 mio mt. Due to the export tax system nearly all of its production goes into the domestic crushing industry; exports of sunflowerseeds are of minor importance. Other exporters include Russia, Ukraine, and other Eastern European countries. The EU is by far the most important importer, followed by Turkey and Mexico.

*Outlook 2005-2014*

In the following section, we take a closer look at OECD-FAO’s and FAPRI’s 2005 oilseed sector forecasts. In order to be able to compare them, the FAPRI time series for soybeans, rapeseed/canola and sunflowerseed were aggregated in line with OECD-FAO’s definition of oilseeds.

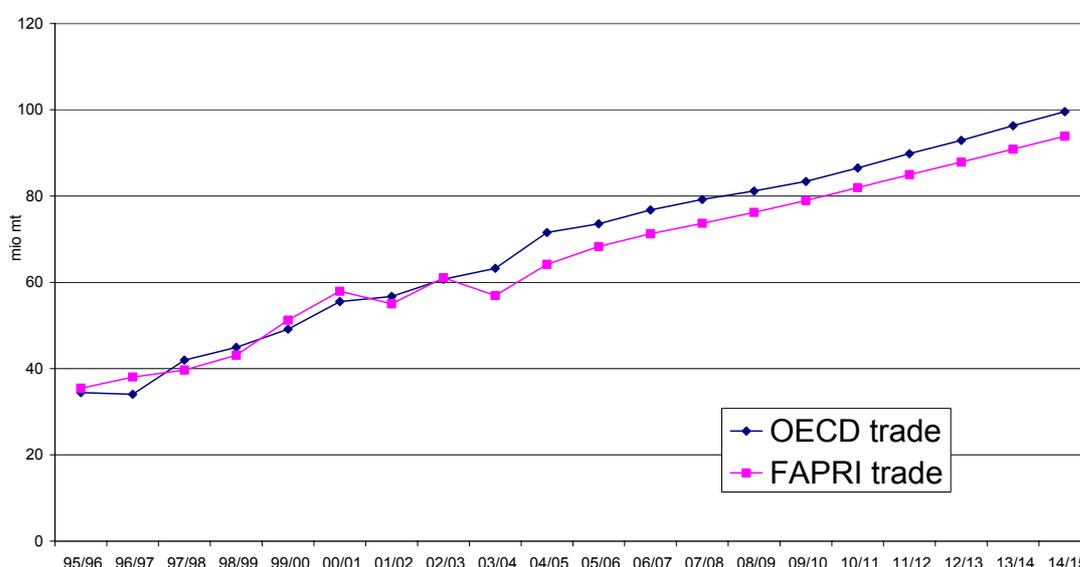
Both forecasts are almost identical: they see oilseed **production** and **consumption** at around 340-350 mio mt in 2014, up from 270-280 mio mt (consumption) and 280-300 mio mt (production) in 2004.

**Table 5.5 Outlook for world oilseeds crops markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 54                | 54                 | 47             |
| 1990/92 (FAOSTAT)  | 73                | 71                 | 51             |
| 2000/02            | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | <b>136</b>        | <b>133</b>         | <b>156</b>     |
| 2010/12 (FAPRI)    | <b>134</b>        | <b>135</b>         | <b>146</b>     |

**Trade** projections are similar (see graph 5.6): world oilseed trade could increase by half of its current level to almost 100 mio mt in 2014. OECD's estimate is slightly higher throughout the forecast period, though the increase in absolute terms is equal for both forecasts.

**Graph 5.6 World oilseed net trade, 1995-2014**



Both forecasts essentially predict the same developments for 2005-2014:

- Oilseed area is likely to expand further, although at a moderate pace (+ 1 % p.a. over the next decade)
- Oilseed consumption, driven by rising income and growing population will increase by more than 2 % p.a.
- Due to increases in productivity and area, oilseed production will follow consumption.
- Oilseed trade is likely to grow by about 3.5 % annually over the next ten years.

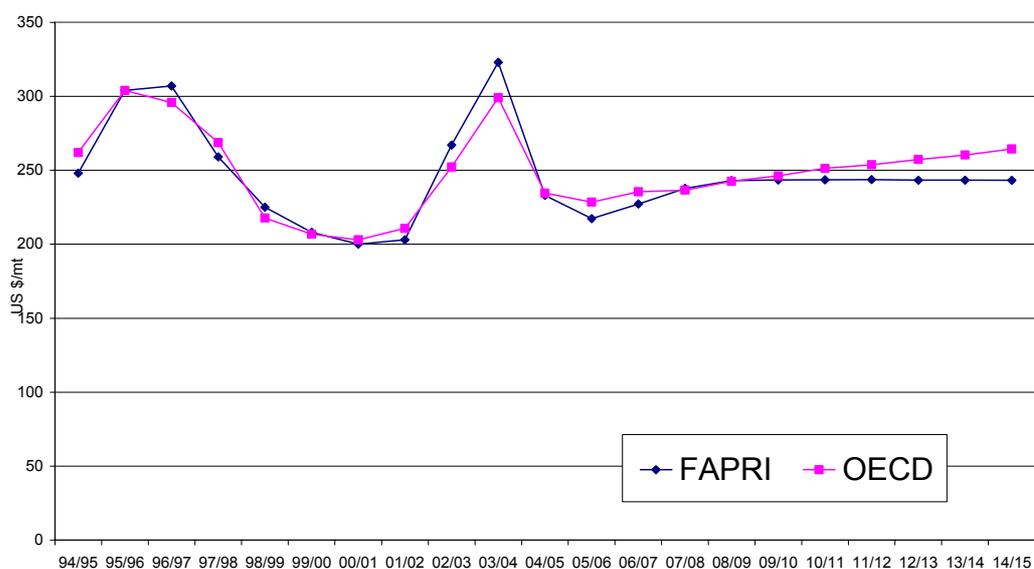
The most interesting – and perhaps questionable point – is that both forecasts imply continued robust growth, but a slow-down in the growth of consumption and production in comparison to the recent performance of the sector.

Other consequences resulting from the forecast expansion of the oilseed sector include:

- Additional oilseed acreage of about 13 mio ha will have to be found, mainly new soybean area in South America.
- The oilseed sector will have to significantly step up its bulk transport capacity (+ 2 to 3 mio mt p.a.) and investments in the oilseed processing sector should continue at a robust pace.
- As the exported share of global oilseed production increases, there is a growing need for a transparent and predictable legal framework (GMO, SPS).

As far as the **price forecasts** are concerned, OECD foresees a stronger recovery in nominal terms than FAPRI (see graph 5.7): from 235 \$/t, the level seen in 2004/2005, to 264 \$/t in 2014/2015, compared to FAPRI with 243 \$/t. The projected upward adjustments in oilseeds prices are also different: OECD expects a rather linear increase, whereas FAPRI projects a steep increase in the near future and a stable price afterwards.

**Graph 5.7 Soybean price, 1994-2014**



*Trade projections by country*

**USA:** FAPRI is clearly less optimistic on the US export potential for oilseeds than OECD. FAPRI is expecting net-exports to decline slightly in the near future and from 2008/2009 until the end of the forecasting period, they are likely to stagnate at 25 mio mt. OECD on the other hand foresees exports steadily increasing to reach about 33 mio mt in 2014/2015.

For **Brazil**, FAPRI is far more optimistic than OECD: exports could double from the current level to reach 45 mio mt by 2014/2015; OECD predicts a more moderate

increase to 36 mio mt. Both forecasts agree that Brazil will overtake the USA as the most important oilseed exporter. The question is when this will occur. For FAPRI it is very soon (assuming normal conditions); for OECD it is likely to happen only in the second half of the forecast period.

**Argentina's** oilseed exports (mainly soybeans, but also some sunflowerseed) are expected to rise either to 18 mio mt (OECD), which is double the current quantity, or to 14 mio mt (FAPRI) in 2014/2015.

If the projections for the “big three” oilseed exporters are combined, both FAPRI and OECD agree on the overall increase in exports, but disagree on the share that Brazil will have in world exports: close to 50 % according to FAPRI, but just above one third according to the OECD.

Both institutions agree that the minor exporters (Canada, Australia) will increase their exports slightly. In the case of CIS/Eastern Europe net-exports could go either way, depending on which forecast you look at.

On the import side, both OECD and FAPRI expect **China** – already the largest net-importer of oilseeds – to double its imports to 44-45 mio mt and, therefore, to absorb almost half of the oilseeds traded in 2014/2015. The **EU-25** will continue to be the second major importer, although FAPRI forecasts its imports will stagnate at between 16 and 17 mio mt while OECD foresees them increasing significantly to reach 24 mio mt in 2014/2015. **Japan** is currently ranked third, and its imports are forecast to remain virtually unchanged at about 7-7.5 mio mt. **Mexico's** imports will increase by about 2 mio mt to 7 mio mt (according to OECD; no FAPRI estimate available). Assuming no changes take place in current trade policy, India is unlikely to participate in the international oilseed trade (although OECD expects India to export small amounts in the outer part of the forecast period).

In summarizing the recent evolution and expected changes in world oilseed trade, it can be concluded that the main USA-EU trade axis which prevailed only ten years ago will be substituted by the South America-China axis in ten years time.

## 5.2. Oilmeals

Production and consumption of **oilmeals** will basically follow the growth pattern of oilseeds although the share of oilmeals traded is unlikely to increase further as crushing capacity improves where the meals are consumed. Argentina and Brazil together are expected to account for at least three quarters of world oilmeal exports in 2014. The EU, already by far the most important importer is likely to increase its imports further.

Oilseed cakes or meals are protein-rich feedstuffs for animal production. They compete with by-products from the grain processing industry like corn gluten feed and animal and fish meals.

The data source used, FAOSTAT, does not provide data on an oilmeals aggregate. For this reason, three major oilmeals have been selected for a more specific description: soybean meal, rapeseed meal, and sunflowerseed meal. Although sunflowerseed meal is ranked fourth after cottonseed meal in terms of consumption and production, the latter is not considered here (neither does it appear in OECD's oilmeals aggregate), as trade in cottonseed meal is insignificant.

### *Developments since 1980*

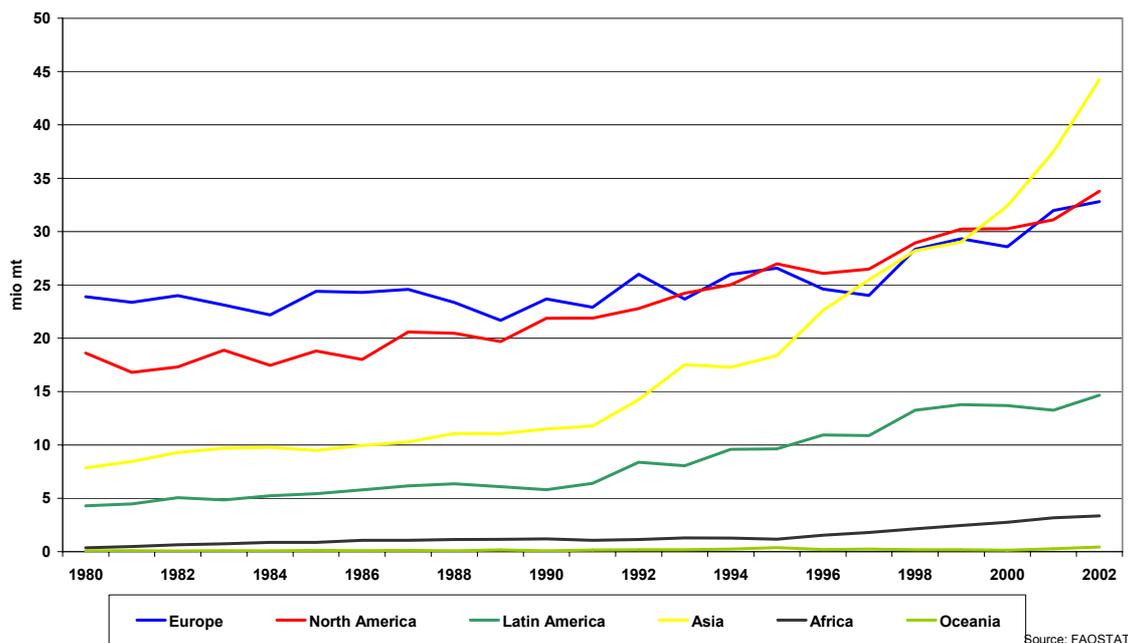
#### **Soybean meal**

**Table 5.6 Evolution of world soybean meal markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 58                | 57                 | 17             |
| 1990/1992 | 70                | 69                 | 24             |
| 2000/2002 | 118               | 118                | 38             |

Driven by increased demand for meat, **consumption** of soybean meal - the major feedstuff for animal production - rose at a robust rate (3.8 % p.a.) from 1980 to 2002. From the first sub-period (1980-1992) to the second (1992-2002), the growth rate almost tripled from 2.1 % to 5.9 %. The regional breakdown (see graph 5.8) shows that this increase in demand took place almost exclusively in Asia. In 1991, the turning point, Asia absorbed only half the level of soybean meal consumed in North America and Europe, yet by the 1999-2000 period it had surpassed both. Latin America's consumption also grew at rates above world average.

**Graph 5.8 Soybean meal consumption 1980-2002, main regions**



World **production** followed consumption. On a regional basis, soybean meal production has shifted southwards and eastwards. In 1980, North America was by far the most important soybean meal producing region but it has since been overtaken by both Latin America in 2001, and latterly by Asia. Nevertheless, the USA is still the largest single soybean meal producer and production is still expanding: 3 % p.a. in 1992-2004. China is the second major producer with 22.7 mio mt having undergone a record growth rate of 17.7 % in 1992-2002, followed closely by Brazil, Argentina and the EU.

World soybean meal **trade** totalled 38 mio mt in 2000-2002. The most important exporter is Argentina, followed by Brazil. Combined they account for three quarters of soybean meal exports. The USA is in the third place, followed by India, Bolivia, Paraguay and recently China, all of which are minor exporters. By far the most important importer is the EU which absorbed 17.4 mio mt in 2003. All other importers import less than 2 mio mt.

### Rapeseed meal

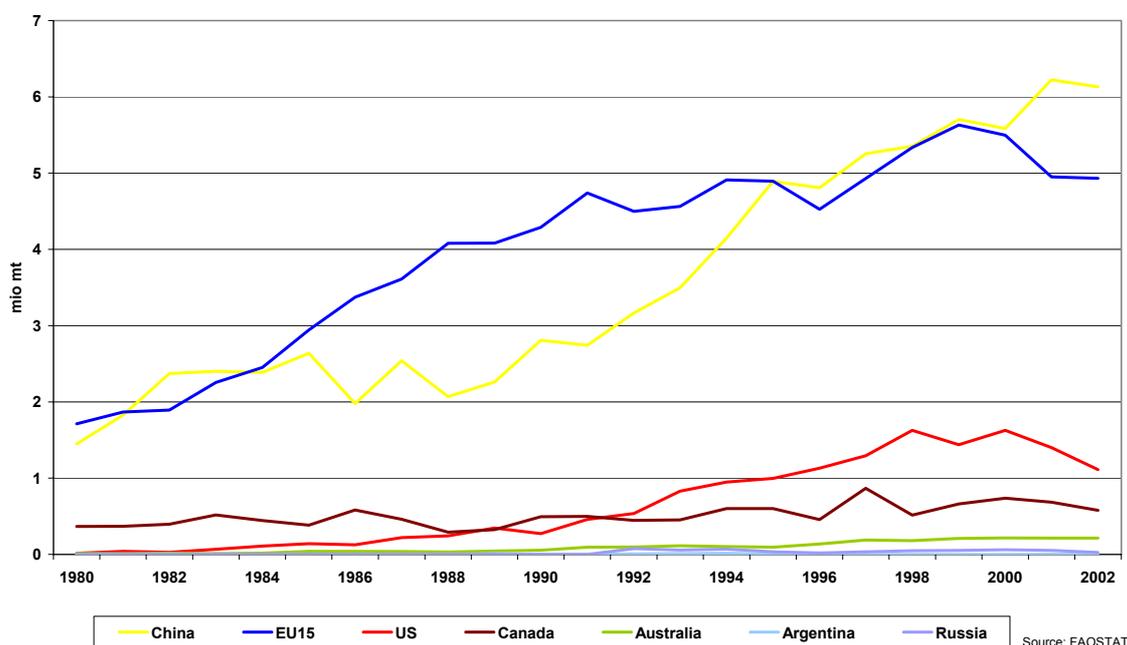
Rapeseed meal is the second most important oilmeal in terms of world consumption and production: both are around 20 mio mt (2000-2002).

**Table 5.7 Evolution of world rapeseed meal markets (mio mt)**

|           | Production | Consumption | Exports |
|-----------|------------|-------------|---------|
| 1980/1982 | 7          | 7           | 0.5     |
| 1990/1992 | 14         | 14          | 2       |
| 2000/2002 | 20         | 20          | 2.3     |

**Consumption** grew at a robust rate of 5.5 % from 1980-2002 with a pronounced slow-down from the first to second sub-period. Once again, this is due to the fact that the rapeseed sector had been in its “take-off” stage in the early 1980s. At regional level, Asia, which is the largest consumer accounting for more than half of world consumption, experienced above average growth rates. Meanwhile Europe, in second place, saw below average increases. As a consequence, Asia’s consumption in 2002 was double that of Europe’s, even though the two had similar consumption levels only 20 years before. In North America, consumption was mainly driven by US demand. At country level, three countries account for the bulk of the world’s rapeseed meal consumption: China, which has overtaken the EU as the world’s leading consumer, and India in third place (see graph 5.9).

**Graph 5.9 Rapeseed meal consumption 1980-2002, some selected countries**



Rapeseed meal **production** followed demand, in terms of quantity and geography. The main producing region is Asia, followed by Europe and North America. China has been the most important producer since the early 1990s, when it overtook the EU, and India is again third although its rapeseed meal production levels have been stagnating over the last 10 years. Canada and Japan’s production levels are similar. Given the almost identical distribution of consumption and production, **trade** in rapeseed meal is small relative to total consumption. The share traded is only about 8 %, the smallest of the three oilmeals considered in this report. In terms of quantity traded, rapeseed meal is less important than sunflowerseed meal.

Moreover, trade of rapeseed meal tends to take place more within regions than between regions. **Canada**’s exports (1.1 mio mt in 2003) are essentially shipped to the **USA** (imports of 1.1 mio mt in 2003). This accounts for at least half of world trade. The **EU-15** is the second most important importer, and obtained its rapeseed meal from neighbouring **Eastern European** countries (which have since become members of the EU) while Asian importers such as **South Korea** and **Thailand** are supplied by India and China.

## Sunflowerseed meal

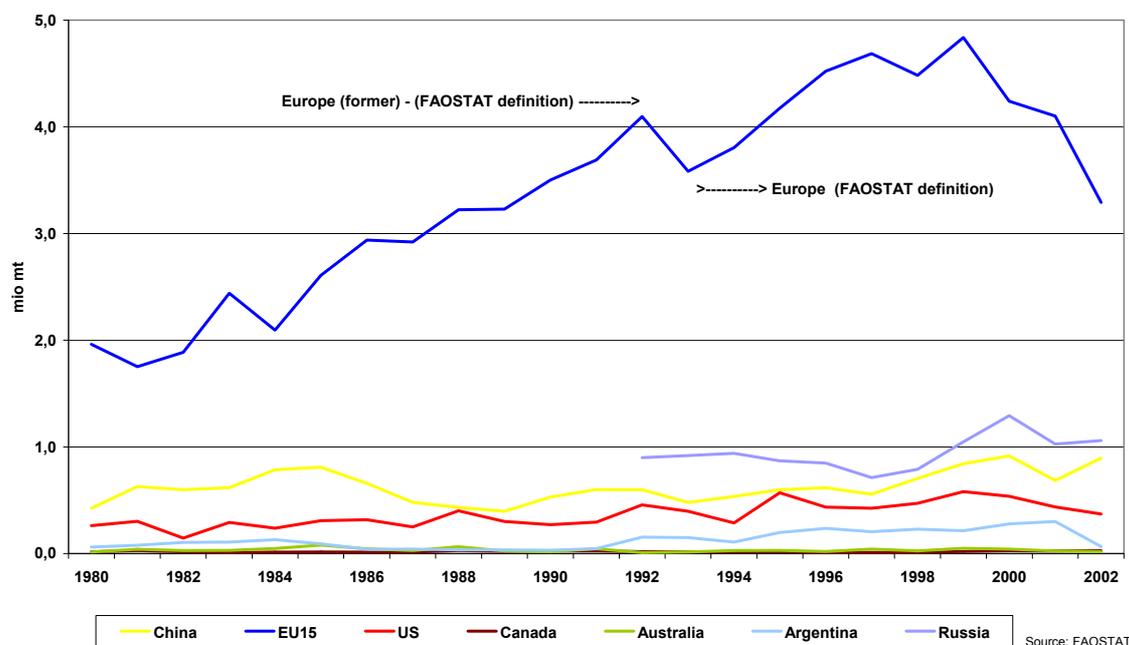
**Table 5.8 Evolution of world sunflowerseed meal markets (mio mt)**

|           | Production | Consumption | Exports |
|-----------|------------|-------------|---------|
| 1980/1982 | 6          | 6           | 0.7     |
| 1990/1992 | 10         | 9           | 1.9     |
| 2000/2002 | 10         | 10          | 2.3     |

Sunflowerseed meal consumption and production had steadily risen until the early nineties when it entered a 4-year cycle with no clear trend (as was the case with sunflowerseed itself). In response to this, the growth rate of sunflowerseed meal consumption was relatively high between 1980 and 1992 but the calculated trend for the subsequent period (1992-2002) is slightly negative.

Sunflowerseed meal **consumption** (10.4 mio mt in 2000-2002) is concentrated in Europe, with Asia, the second most important region, ranking far behind in terms of quantity. However, whereas Europe's highly unpredictable consumption declined in 1992-2002, Asia's consumption continued to grow, albeit at a slower pace than that seen in the first sub-period (1980-1992). The most important sunflowerseed meal consumer is the EU (3.9 mio mt in 2000-2002), followed by Russia (1.1 mio mt) and China (0.8 mio mt). Ukraine, USA, India, South Africa and Argentina consumed less than half a million mt each in 2003 (see graph 5.10).

**Graph 5.10 Sunflowerseed meal consumption 1980-2002, some selected countries**



**Production** and consumption evolved in the same manner. Regionally, Asia's growth in sunflowerseed meal production was fastest from 1980-2002 (4.2 %), but this came almost to a standstill in 1992-2002. Asian production totalled 1.9 mio mt

in 2000-2002, with 0.8 mio mt in China and 0.3 mio mt in India. European production declined in the second split-period after it had posted the highest growth rate in 1980-1992. Inside Europe, a rather sharp decline in the EU in the first period (1992-2002) was partly compensated by increased production, notably in Russia and Ukraine. Thanks to Argentina, Latin America's production (1.7 mio mt) is similar to that of Asia.

Roughly a quarter of all sunflowerseed meal consumed has been imported. Given the deficit in sunflowerseed meal in Europe and Asia, Argentina – the principal exporter (1.2 mio mt in 2003) – exports to both regions. Moreover, there is some intra-European trade between Ukraine and Russia (exporters) and the EU and Turkey (importers). Ukraine has stepped its exports up substantially in recent years and is now the second major exporter (0.9 mio mt in 2003).

#### *Outlook 2005-2014*

FAPRI forecasts cover several specific oilmeals, while OECD has calculated an aggregate comprised of soybean meal, rapeseed/canola meal and sunflowerseed meal. FAPRI's forecasts have therefore been combined to make the two projections comparable.

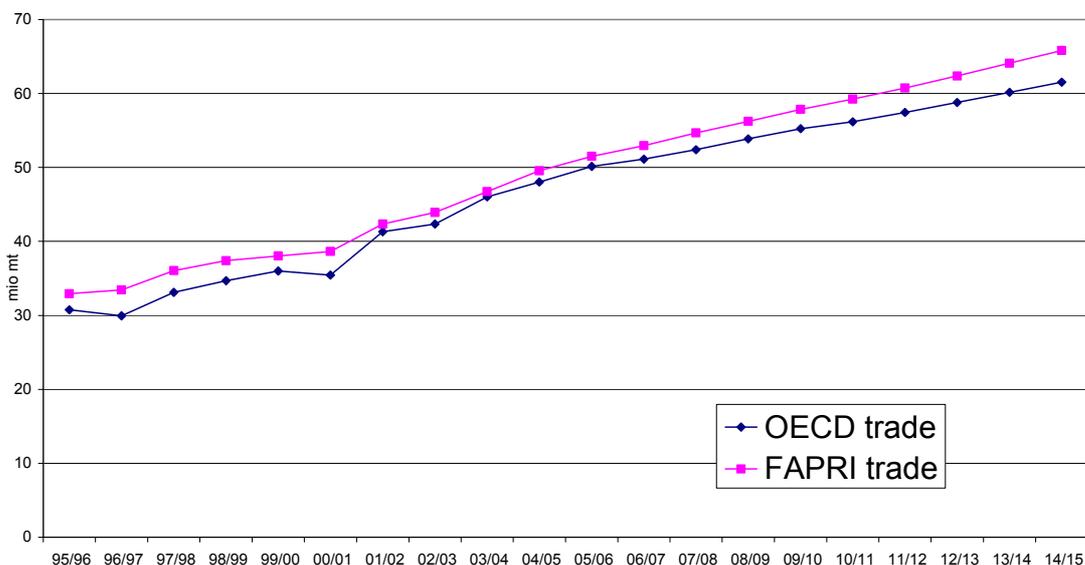
**Table 5.9 Outlook for world oilseeds crops markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 2000/2002          | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/2012 (OECD)   | <b>135</b>        | <b>136</b>         | <b>145</b>     |
| 2010/2012 (FAPRI)  | <b>136</b>        | <b>134</b>         | <b>146</b>     |

World oilmeal **consumption and production** is expected to continue growing: OECD forecasts an annual increase of 2.5 % for both consumption and production over the forecast period 2005-2014, FAPRI 2.4 %. This is equivalent to a 40-50 mio mt increase which would bring the total level up to about 220 mio mt in 2014.

Prospects for world oilmeal **trade** differ slightly depending on the source: FAPRI foresees a higher growth potential (14 mio mt or 2.8 % p.a.) than OECD (11 mio mt or 2.3 %). OECD's figures for the average increase in trade and the projected growth in production and consumption also seem to suggest that the share of oilmeals traded will diminish.

**Graph 5.11 World oilmeals net trade, 1995-2014**



OECD's weighted average of oilmeal **prices** is projected to increase steadily from 150 \$/t to 166 \$/t in 2014. FAPRI, on the other hand, expects prices to remain stagnant for soybeanmeal (CIF Rotterdam).

#### *Trade outlook by country*

In 2014/2015, **Argentina** is expected to be the largest oilmeal exporter with net-exports of between 27 mio mt (OECD) and 30 mio mt (FAPRI), up from the current level of 22 mio mt. **Brazil** is forecast to be the second largest exporter with 23 mio mt (FAPRI) or 20 mio mt (OECD) in 2014/2015; its current exports stand at 16-17 mio mt. The two countries together are expected to account for at least three quarters of world oilmeal exports in 2014.

**India**, though a minor exporter could increase its exports to about 6 mio mt (OECD), and therefore exceed the exports of the **USA**, or maintain its sales abroad in the 2-3 mio mt range (FAPRI).

The **EU-25**, already by far the most important importer is likely to increase its imports further to reach almost 30 mio mt in 2014 (up from about 25 mio mt in 2004/2005), according to both institutions.

### 5.3. Oils

Global consumption and production of **vegetable oils** has increased at the fastest pace of all sectors in the oilseeds/meals/vegetable oils complex and is expected to continue doing so. Two thirds of all vegetable oil exports in 2014/2015 will come from Malaysia and Indonesia. The EU as a net-importer will continue to rank behind China and India. Due to strong demand, vegetable oil prices are likely to strengthen over the next ten years.

#### Vegetable Oils

##### *Developments since 1980*

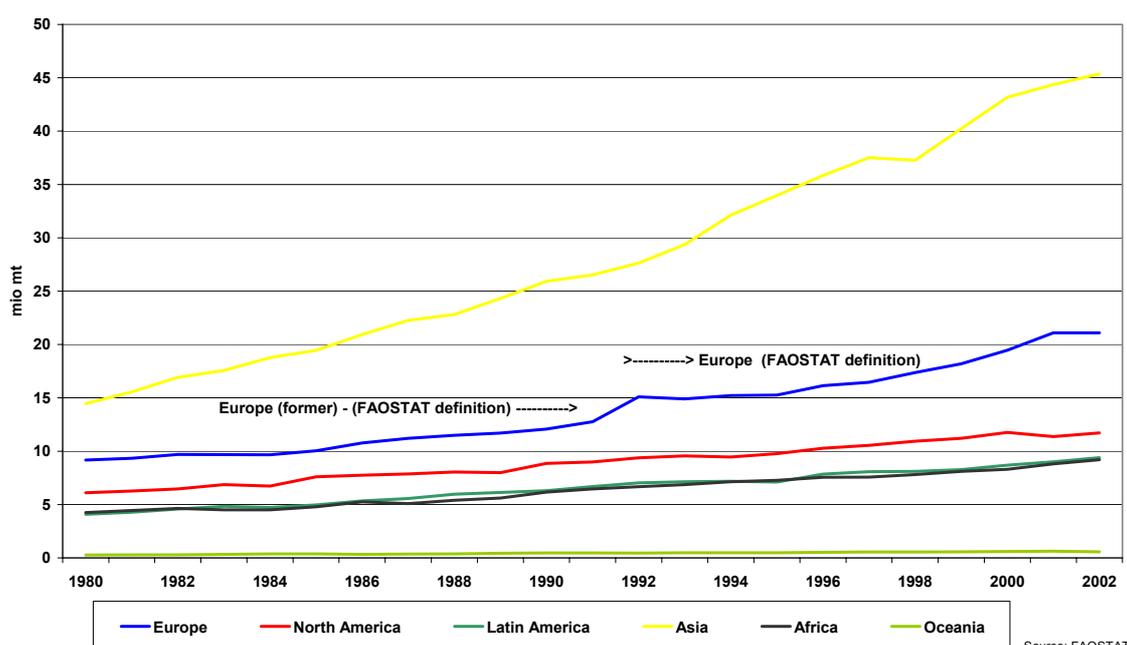
Demand for vegetable oils has been the driving force in the oilseed sector.

**Table 5.10 Evolution of world vegetable oil markets (mio mt)**

|           | Production | Consumption |
|-----------|------------|-------------|
| 1980/1982 | 44         | 44          |
| 1990/1992 | 66         | 65          |
| 2000/2002 | 99         | 95          |

**Consumption** has been growing fast – on average at 4 % p.a. for over two decades. This growth has taken place all over the world, but Asia, which currently accounts for half of global consumption has shown by far the highest expansion (5.3 % p.a.) over the last 25 years (see graph 5.12).

**Graph 5.12 Vegetable oils consumption 1980-2002, main regions**



Per capita consumption of vegetable oils also increased in all parts of the world, albeit in a varied fashion; Africa's growth rate was the weakest, whereas Asia doubled its per capita consumption over the period (although it still only stands at a third of North American and European levels).

**Production** of vegetable oils was stepped up in line with growing demand, although regional increases were not necessarily in line with consumption. The fastest increase in production has taken place in Asia which, at almost 6 % p.a. between 1980 and 2002, was higher than that of consumption, thus making it a small net vegetable oils exporter. In Latin America, the most important export region, production also grew faster (4.5 %) than the world average and faster than consumption in this region. Europe and Africa are net-importing continents.

The share of **vegetable oils traded** in total consumption stands currently at about 37 %, higher than the corresponding figure for oilseeds. Within this aggregate the four major vegetable oils are, in descending order, palm oil, soybean oil, rapeseed/canola oil and sunflowerseed oil which together account for about 80 % of total vegetable oil consumption and production.

### **Palm oil**

The world market for vegetable oils (and thus for oilseeds) is dominated by palm oil and soybean complex. Due to stronger growth rates, palm oil is now overtaking soybean oil as the main vegetable oil.

**Table 5.11 Evolution of world palm oil markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 6                 | 5                  | 3              |
| 1990/1992 | 12                | 11                 | 8              |
| 2000/2002 | 24                | 21                 | 16             |

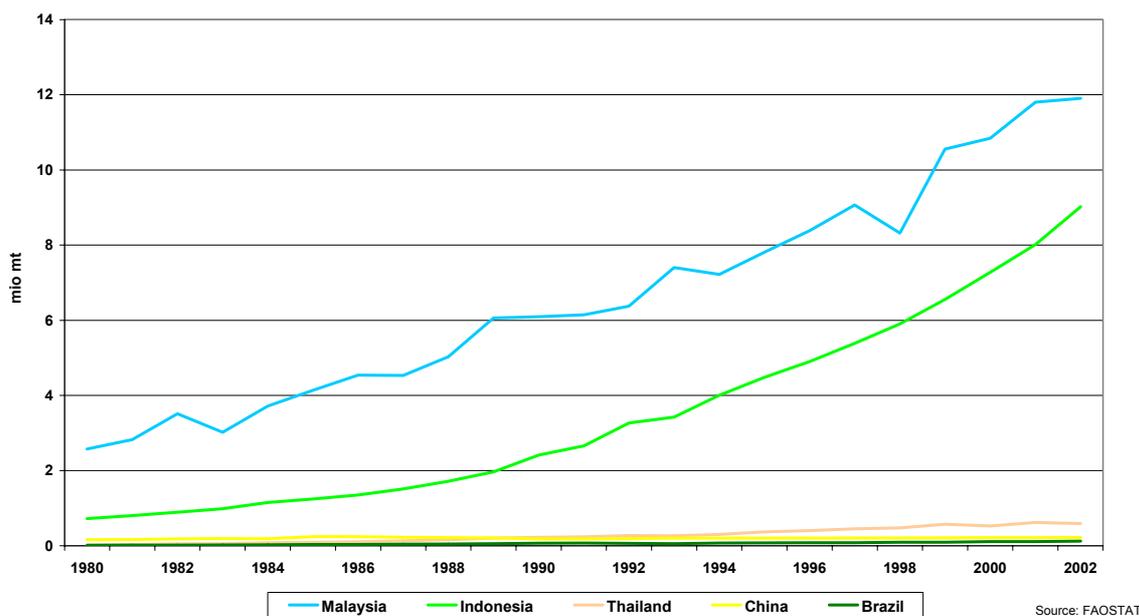
The palm oil sector is different from the rest of the oilseed complex in various aspects:

- There are several years between planting and first harvest.
- Due to its composition of fatty acids, palm oil is the cheapest of all major vegetable oils. This makes it the preferred option for food use in developing countries and for industrial use in developed countries.
- There is no coupled product worth trading i.e. meal or cake. The palm fruit is processed immediately after harvest, and there is no trade in palm fruits. After crushing of the palm fruit, the remaining palmkernels are crushed with palmkernel oil and meal as final products.

**Consumption** of palm oil has grown at very high rates over the last 25 years, on average at 7.4 % p.a. over the period 1980-2002. Africa (4.1 %) and North America (1.7 %) experienced below average growth rates, while Asia and Latin America posted growth rates of 9 % or more.

**Production** has increased in response, notably in Asia where it increased by 8.7 % annually between 1980 and 2002, mainly due to an increase in the area planted with oil palms. In 2002, more than 80 % of world palm oil production (25 mio mt) took place in Malaysia (12 mio mt) and Indonesia (9 mio mt) (see graph 5.13). However, while Indonesia's production growth accelerated from 9 % in 1980-1992 to 10.7 % in 1992-2002, Malaysia's fell from 12 % p.a. in the first sub-period to 6.5 % in the second. Indonesia also consumes between one quarter and one third of its production while Malaysia sells more than 80 % of its production abroad.

**Graph 5.13 Palm oil production 1980-2004, some selected countries**



In 2003 world **trade** is estimated at 21 mio mt, with Malaysian exports at 12 mio mt and Indonesian at 6 mio mt. Main importers are the EU (2.8 mio mt), India (4 mio mt), China (3.4 mio mt) and Pakistan (1.2 mio mt).

## Soybean oil

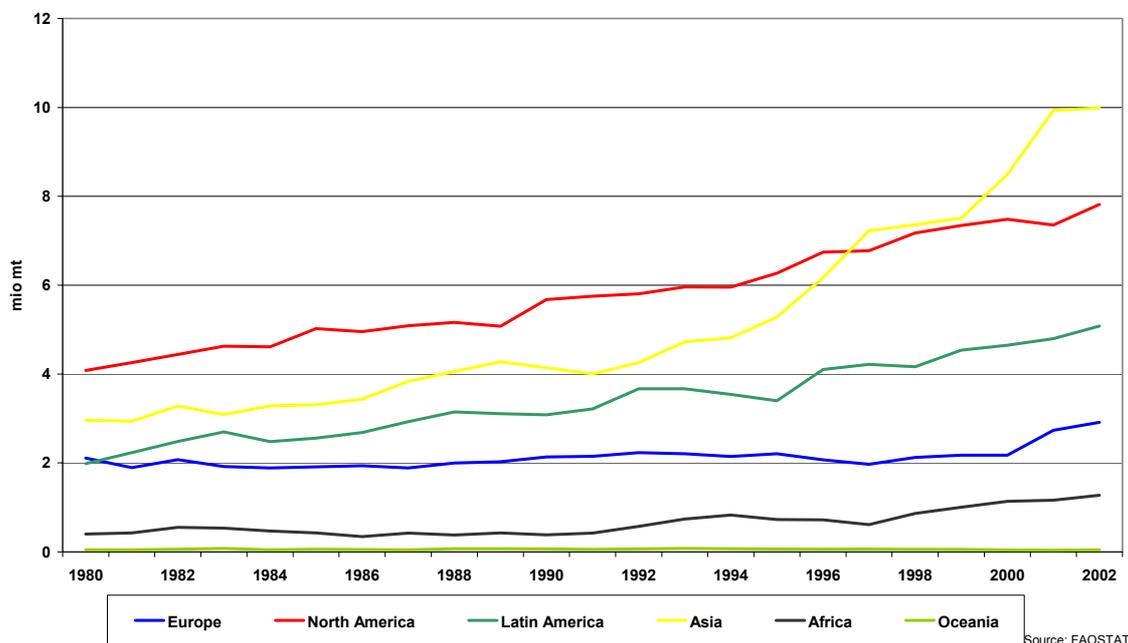
**Table 5.12 Evolution of world soybean oil markets (mio mt)**

|           | Production | Consumption | Exports |
|-----------|------------|-------------|---------|
| 1980/1982 | 13         | 12          | 3       |
| 1990/1992 | 16         | 16          | 3       |
| 2000/2002 | 27         | 26          | 8       |

World soybean oil **consumption** has seen robust growth (3.8 % p.a.) over the last quarter of a century, with a clear acceleration in the second half of the period to 5 % p.a. Most of this has come as a result of increased demand in the two major consuming countries, China and India, both of which experienced annual growth rates in excess of 10 % between 1992 and 2002. In 2005/2006, China is expected to become the largest soybean oil consumer in the world, overtaking the USA, the long standing champion. African demand also grew at rates above the world average, but

per capita consumption is still very low. Consumption in developed countries has either experienced only moderate growth (USA) or virtually stagnated (EU-15, Japan).

**Graph 5.14 Soybean oil consumption 1980-2002, main regions**



The increase in soybean oil **production** was driven by, and mirrored, the increase in consumption. The main producing countries are the USA, followed by China and Brazil (who produce similar quantities), Argentina, the EU and India. Argentina and Brazil account for about 80 % of world exports of soybean oil.

Trade in soybean oil accounts for about 30 % of consumption and production. The main players are:

**USA:** Soybean oil production has been typically around 8.5 mio mt per annum in the last years. Exports are small in comparison (0.5-1 mio mt) and declining as growth in production has not matched that of consumption.

**China:** Consumption has grown by almost 16 % p.a. over the last decade. Although increase in production kept pace with this, China is nevertheless the largest importer of soybean oil. FAOSTAT estimates that consumption will rise from 4.7 mio mt in 2002 to almost 8 mio mt for this 2005/2006 year. Production now stands at between 5.5 and 6 mio mt, so its current imports are expected to exceed 2 mio mt.

**Argentina:** due to investments in the crushing sector, soybean oil output has grown from 1.7 mio mt 10 years ago to about 5 mio mt today. Only a very small fraction of this is consumed domestically, the rest is exported. Differential export taxes favour the export of soybean oil (and meal) rather than that of soybeans.

**Brazil:** Soybean oil production is growing with the expansion of the crushing industry. Over the last ten years, oil output increased by almost 2 mio mt to currently about 5.5 mio mt. As domestic consumption has grown at a slower pace,

exports almost doubled over the last decade; they now account for half the produced quantity.

To satisfy its consumption, **India** complements domestic production (2002: 1.1 mio mt) with imports (2002: 1.2 mio mt).

### Rapeseed oil

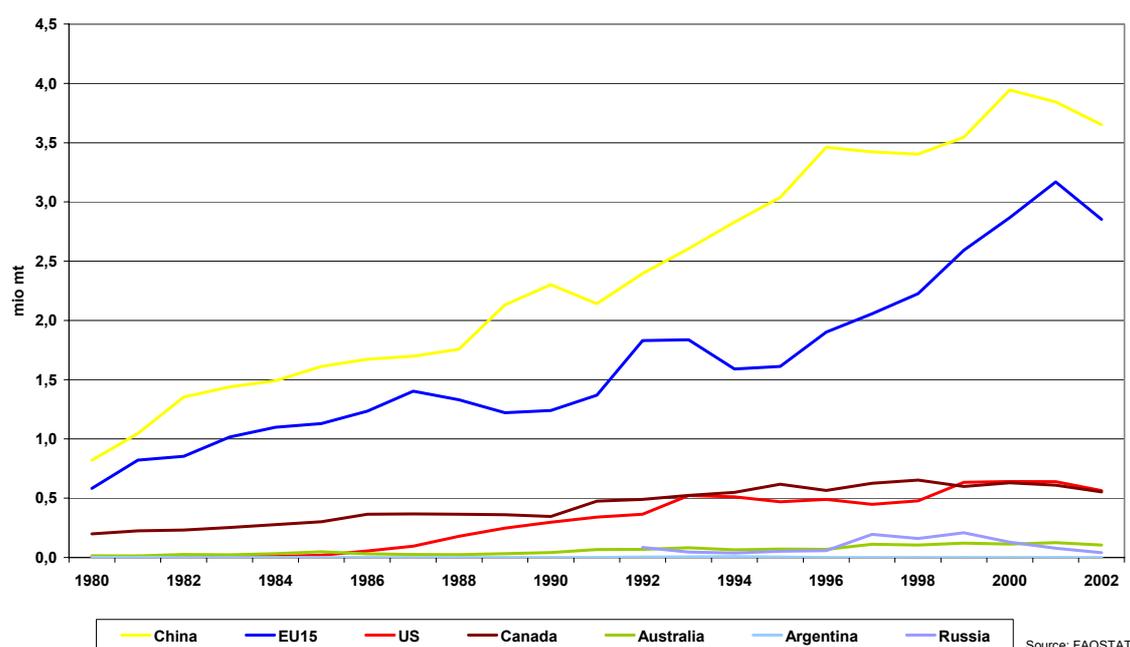
Rapeseed oil is the third major vegetable oil. At present, rapeseed oil consumption and production is roughly half the consumption of palm oil or soybean oil.

**Table 5.13 Evolution of world rapeseed oil markets (mio mt)**

|           | Production | Consumption | Exports |
|-----------|------------|-------------|---------|
| 1980/1982 | 4          | 4           | 0.5     |
| 1990/1992 | 9          | 9           | 1.3     |
| 2000/2002 | 13         | 13          | 1.2     |

**Consumption** of rapeseed oil has seen a strong average growth of almost 6 % p.a. since 1980, although this was much faster (over 8 % p.a.) in the first half of the period than the second (2.9 %). The pronounced drop was due to the fact that the rapeseed complex was in its “take-off” stage in the early 1980s after plant-breeding had made rapeseed oil suitable for human consumption. Regionally, consumption is concentrated in Asia, (over 50 % of world consumption), in particular China, India and Japan, and in Europe. From 1980-1992, Latin America, Oceania and North America all experienced above average growth rates in rapeseed oil consumption, but they still account for a relatively small part of world consumption (see graph 5.15).

**Graph 5.15 Rapeseed oil consumption 1980-2002, some selected countries**



**Production** patterns followed consumption closely. In 2002, both production and consumption were 3.5 times higher than in 1980. Like consumption, production is also concentrated in Asia and Europe. From 1992 to 2002, most of the increase in Asian production occurred in China, as India's production, based exclusively on domestic rapeseed production, stagnated at slightly above 1.5 mio mt.

Given that regional distribution of consumption and production are similar, the share of rapeseed oil traded in total consumption is small, about 7-8 %. **Trade** has been just above 1 mio mt in recent years, putting it behind palm oil, soybean oil, sunflowerseed oil, coconut oil and palmkernel oil in terms of trading importance.

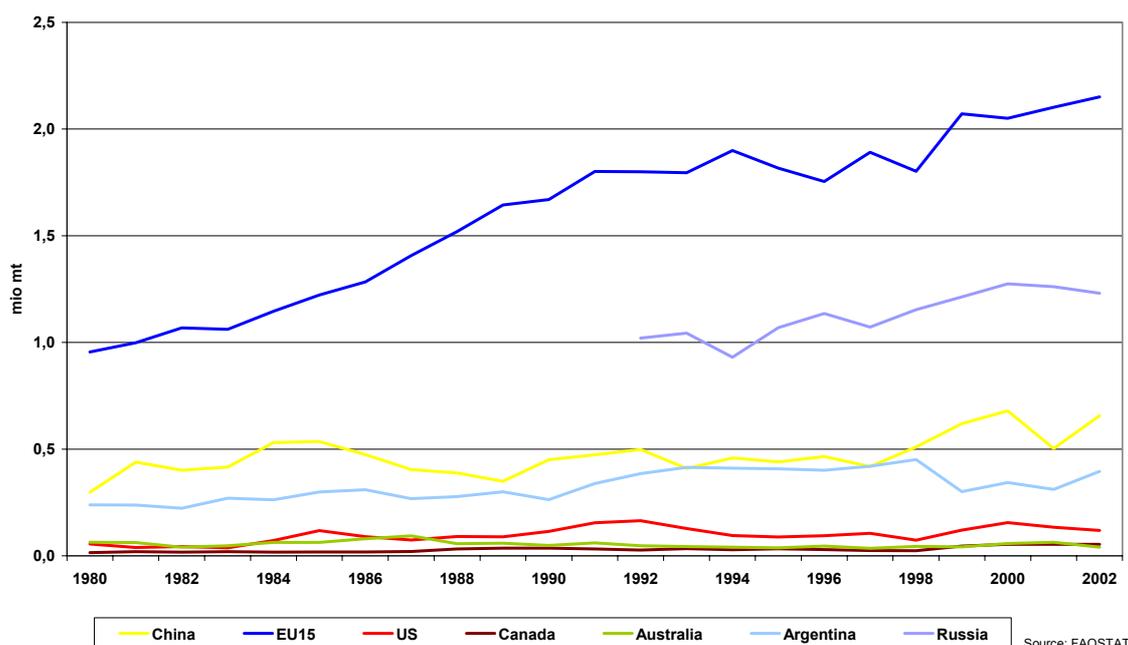
The main exporter is Canada with exports totalling 0.5 mio mt in 2003. The EU, formerly the second major exporter, has lost export market share due to increasing demand from the biodiesel industry (and is actually net-importing rapeseed oil in 2005/2006). In third place is Australia. The main importers are the USA, China and Mexico.

### Sunflowerseed oil

Sunflowerseed oil is the third most widely traded vegetable oil.

In the 1980s, world **consumption** grew at a very strong pace (8.6 % in 1980-1992) but has been virtually stagnant ever since (0.8 % p.a. from 1992 to 2002). By far the most important consuming region is Europe (almost 5 mio mt), followed by Asia (roughly 2 mio mt) and Latin America and Africa, each of which consumes less than 1 mio mt. Within Europe, the EU and Russia's consumption has steadily increased (see graph 5.16), while Ukraine's has fallen in recent years. Asia's growth has been weak, largely because of India's decreasing consumption.

**Graph 5.16 Sunflowerseed oil consumption 1980-2002, some selected countries**



From 1980 to 1992, **production** followed the upward-trend of consumption from about 5 mio mt in 1980 to 8 mio mt in the early 1990s. Since then, it has been very unstable and has shown no clear trend. As with consumption, more than half the production takes place in Europe, followed by Asia and Latin America.

Argentina, whose production of sunflowerseed oil varies over time, is the main exporter. Recently, it has produced about 1.5 mio mt of which one third was consumed domestically and two thirds were exported. Ukraine is the other major exporter (almost 1 mio mt in 2003). Importers include the EU, Algeria, Egypt, India, Turkey, Iran and Russia.

Total **trade** oscillates between 2.0 and 2.5 mio mt, which corresponds to 25-27 % of production.

#### *Outlook 2005-2014*

FAPRI provides forecasts for several specific vegetable oils, whereas OECD has calculated an aggregate which comprises palm oil, soybean oil, rapeseed/canola oil and sunflowerseed oil. In order to make the two comparable, the FAPRI forecasts were combined to obtain an aggregate identical to OECD's definition.

**Table 5.14 Outlook for world oils markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 45                | 46                 | -              |
| 1990/92 (FAOSTAT)  | 66                | 69                 | -              |
| 2000/02            | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | <b>140</b>        | <b>143</b>         | <b>153</b>     |
| 2010/12 (FAPRI)    | <b>139</b>        | <b>139</b>         | <b>155</b>     |

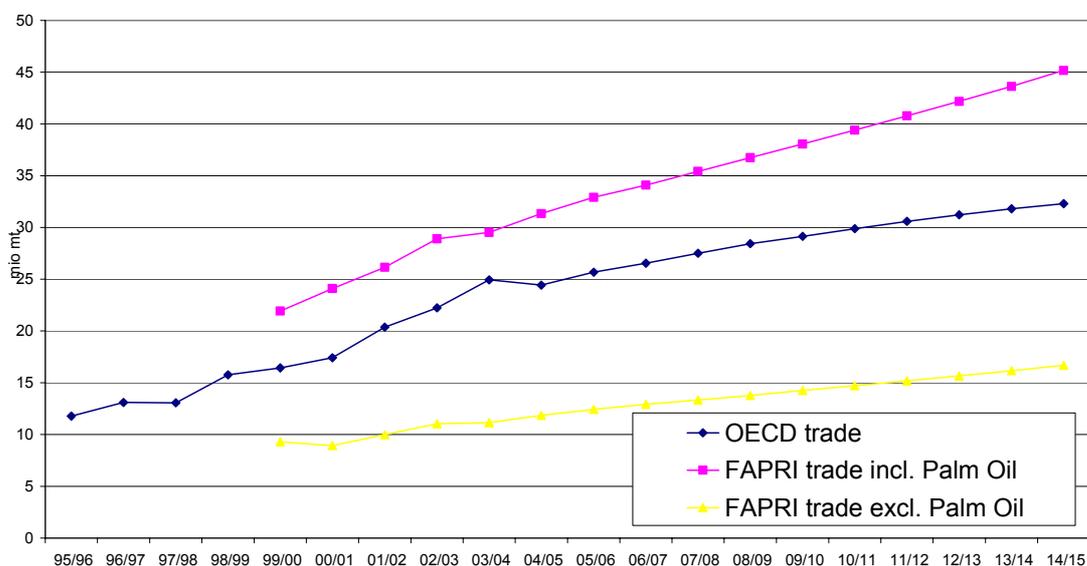
As is the case for oilseeds and oilmeals, the **consumption** forecasts of the two institutions are almost identical. They both expect world vegetable oils consumption to reach around 112 mio mt in 2014, up from the current levels of 85-90 mio mt (4 vegetable oils), which corresponds to an annual growth rate of 2.6-2.7 %. Demand will continue to be boosted by rising population and income growth and will pull **production** up by the same amount.

Both forecasts also agree that world **trade** in vegetable oils trade will continue to increase, but the magnitudes differ completely. Firstly, OECD's projection starts at a lower level than FAPRI's (by 7 mio mt) because its quantities have been lower in the past. Secondly, OECD anticipates a far less pronounced increase in trade than FAPRI. Whereas FAPRI expects world vegetable oils trade to grow by a strong 3.6 % p.a. until 2014, when it would reach 45 mio mt (up 12 mio mt over the forecast period), OECD predicts a more moderate increase of only 7 mio mt or 2.6 % p.a. to reach 32 mio mt in 2014.

Both, however, indicate a significant reduction in the growth rate as compared to the recent past and the difference between the calculations can be attributed to the fact that the OECD model has a different regional aggregation. Unlike FAPRI, OECD's model does not list Malaysia and Indonesia as individual countries, instead placing

them in the “other Asia” aggregate. As an important and increasing share of palm oil trade is intra-Asia, OECD’s model therefore fails to reflect the inherent dynamics of global trade in vegetable oils.

**Graph 5.17 World vegetable oils net trade, 1995-2014**



As demand is growing at a strong pace, both OECD and FAPRI forecast that the **price** of vegetable oils will rise in nominal terms in order to stimulate production. FAPRI expects a slight increase from 530 \$/t in 2004/2005 to 548 \$/t in 2014/2015, with a drop early in the forecast period and a steady recovery afterwards. OECD on the other hand, predicts a continued increase: up from 532 \$/t in 2004/2005 to 619 \$/t in 2014/2015.

#### *Trade forecasts by country*

In this respect, OECD is much more conservative than FAPRI, forecasting smaller changes in both net-import and net-export positions throughout.

**India:** A major difference emerges between the forecasts for vegetable oils imports. OECD expects only imports to increase only slightly over the next ten years, from about 5 mio mt at present to 5.5 mio in 2014/2015. FAPRI, on the other hand sees India’s exports increasing more sharply, reaching 7.5 mio mt in 2014/2015.

For **China**, the relative difference is smaller. Current imports (7 mio mt) could reach 10 mio mt (OECD) or 12 mio mt (FAPRI). Interestingly, both institutions agree that China’s combined WTO import quotas of almost 8 mio mt would not be binding for vegetable oil imports.

**Brazil**’s exports could increase to 3.5 mio mt (OECD) or 5 mio mt (FAPRI) from the current 3 mio mt. In Argentina, exports are foreseen to grow from 5.5 mio mt to 7 mio mt in 2014/2015 (OECD) or 8 mio mt (FAPRI).

The **USA** is not expected to play a major role in future world vegetable trade. OECD expects it to be a small net importing country, while FAPRI anticipates it will be a weak net-exporter.

The **EU-25** is likely to see its trade deficit in vegetable oils increase, mainly due to palm oil imports. FAPRI is predicting 4 mio mt of net imports in 2014/2015 compared to OECD's 3.3 mio mt.

**Canada** is the only country where OECD sees a slightly more pronounced change than FAPRI. The former estimates exports will increase to about 1 mio mt (from the current 0.7-0.8 mio mt). The latter sees it maintaining the status quo over the whole forecast period.

**Malaysia** and **Indonesia**'s palm oil exports could increase from almost 20 mio mt in 2004/2005 to almost 29 mio mt in 2014/2015 (FAPRI; no OECD estimate available).

## 6. SUGAR

**Sugar** stocks started rising in the mid 1980s when production grew faster than consumption. This was particularly marked in Brazil where consumption has increased by one third over the last decade while production has more than doubled. As a result of this surge in low-priced Brazilian exports and growing stocks worldwide, world prices sharply declined in the second half of the 1990s. However, the market has been more balanced in recent years and, according to forecasts, growth in production should now be more or less in line with that of consumption.

### *Developments since 1980*

**Table 6.1** Evolution of world sugar markets (raw equivalent) (mio mt)

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 93                | 91                 | 28             |
| 1990/1992 | 113               | 108                | 29             |
| 2000/2002 | 137               | 132                | 40             |

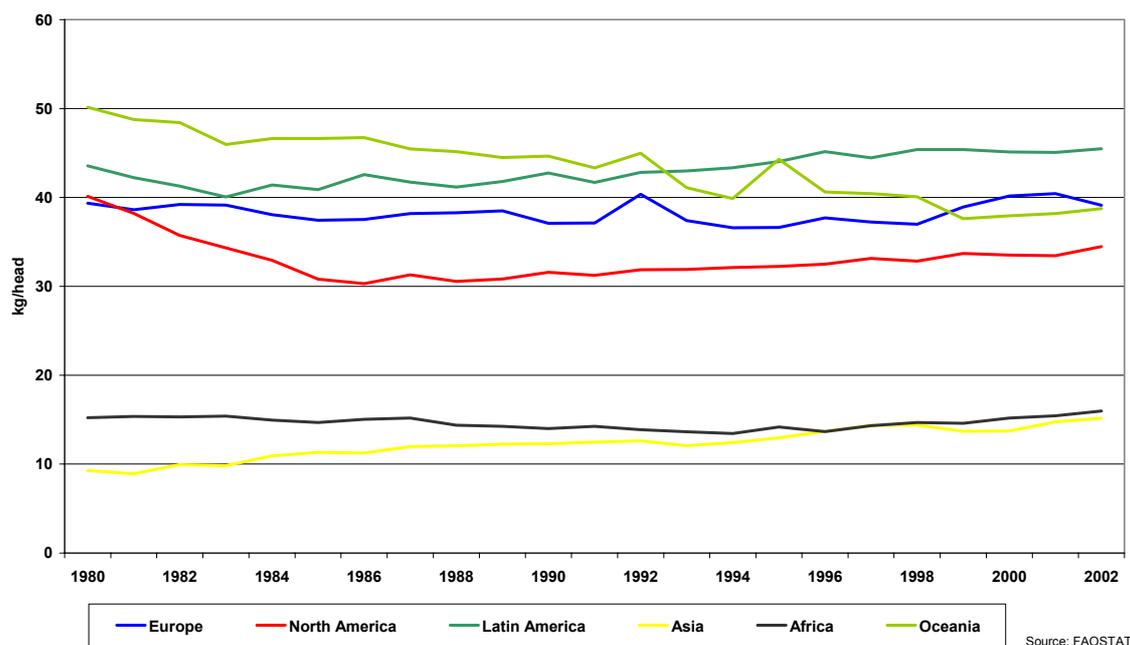
On average over the years 2000-2002, world sugar production reached 137 mio mt, while consumption stood below, at 132 mio mt. Therefore, stocks further piled up. In the early 2000 world exports increased to above 40 mio mt., representing 30 % of production. Like soybeans, sugar is widely traded around the world.

After moderate annual growth from 1980-1992 (below 2 %), sugar **consumption** has been growing faster recently (slightly above 2 %). The overall increase in consumption is in line with demographic growth, but consumption per capita follows a different pattern in developed and developing countries.

Graph 6.1 shows developments in estimated<sup>2</sup> per capita consumption by world region. Since the early nineties Latin America has ranked first with an estimated use of 45 kg per capita. This reflects increases in Brazil and, to a lesser extent, Argentina. In contrast, sugar consumption has declined sharply in Australia. The profile for Europe masks diverging evolutions: per capita consumption in the EU-15 has stabilised at around 38 kg, while in Russia it has increased up to 50 kg. In North America, sugar consumption has experienced renewed growth after losing ground in the 1980s, due to competition with other sweeteners. Sugar use per capita is much lower in Africa and in Asia. In both continents it stands at around 15 kg per capita, yet while this has been stable in Africa, it has steadily increased in Asia, in particular Thailand.

<sup>2</sup> The estimate is obtained by dividing total uses by population. Total uses are the sum of various uses (food, feed and others) indicated in the FAO commodity balances.

**Graph 6.1 Sugar (raw equiv.) per capita consumption 1980-2002, main regions**



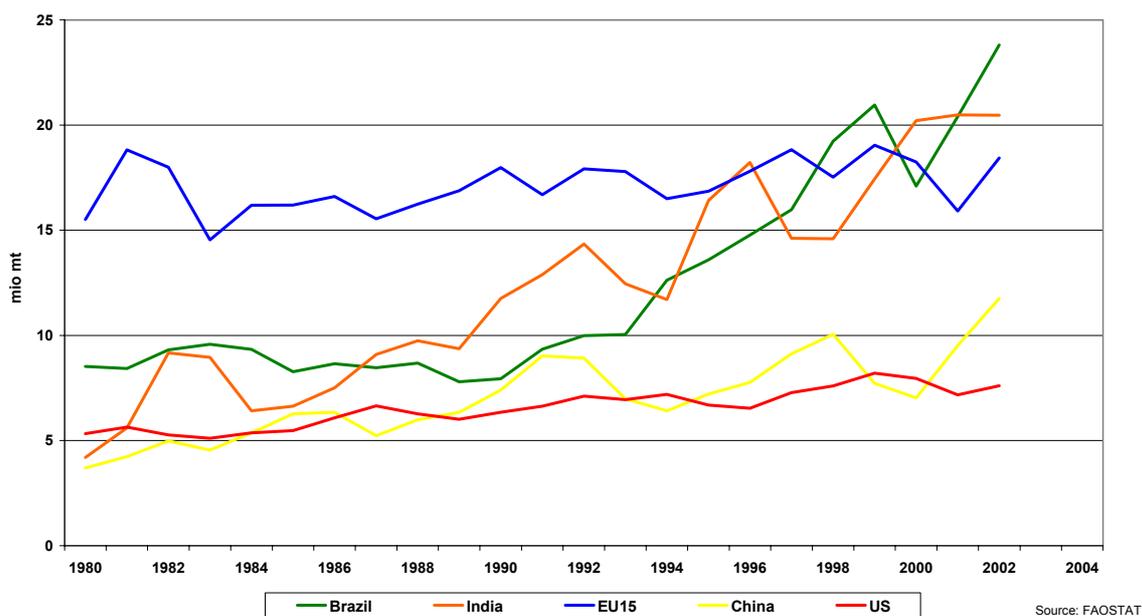
Asia, where the biggest consumers (India & China) are located, was characterised by a sustained annual growth in overall uses of over 4 % during the 1980-2002 period, with the notable exception of Japan. Total consumption has also grown in Latin America. In contrast to these developments, consumption in the EU has remained more or less stable. In North America, the significant decline experienced before the mid 1980s, due to competition from other sweeteners, has stopped, but sugar consumption is still growing at a lower pace than other sweeteners. Finally, in the FSU, after the sharp drop of the early 1990s, consumption has resumed growth in recent years.

Unlike most other crops, world sugar **production** has increased faster than consumption. The annual growth rate for the years 1980 to 2002 for production and consumption was 2.5 % and 1.9 %, respectively. Hence, stocks have expanded since 1985 and prices have declined. This is explained mainly by patterns in the developing world.

Although annual growth has declined in most recent years from previous levels, production in Thailand, India and China grew at annual rates of between 8 % and 14 % over the years 1980-1992. In the mid 1990s, Indian sugar production reached the same level as the EU which was, at the time, the leading world producer. But the big change came from Latin America. Brazilian sugar production took off in the early 1990s and has increased at a sustained annual growth rate since then (9 % up to 2002). The partial liberalisation of the ethanol sector initiated in the mid 1990s created a shift from this sector towards sugar production and exports. The devaluation of the Brazilian currency further enhanced the competitiveness of its exports.

Overall, divergent moves resulted in a decline in the area under beet (mainly in the EU and U.S), while the area under cane has significantly increased.

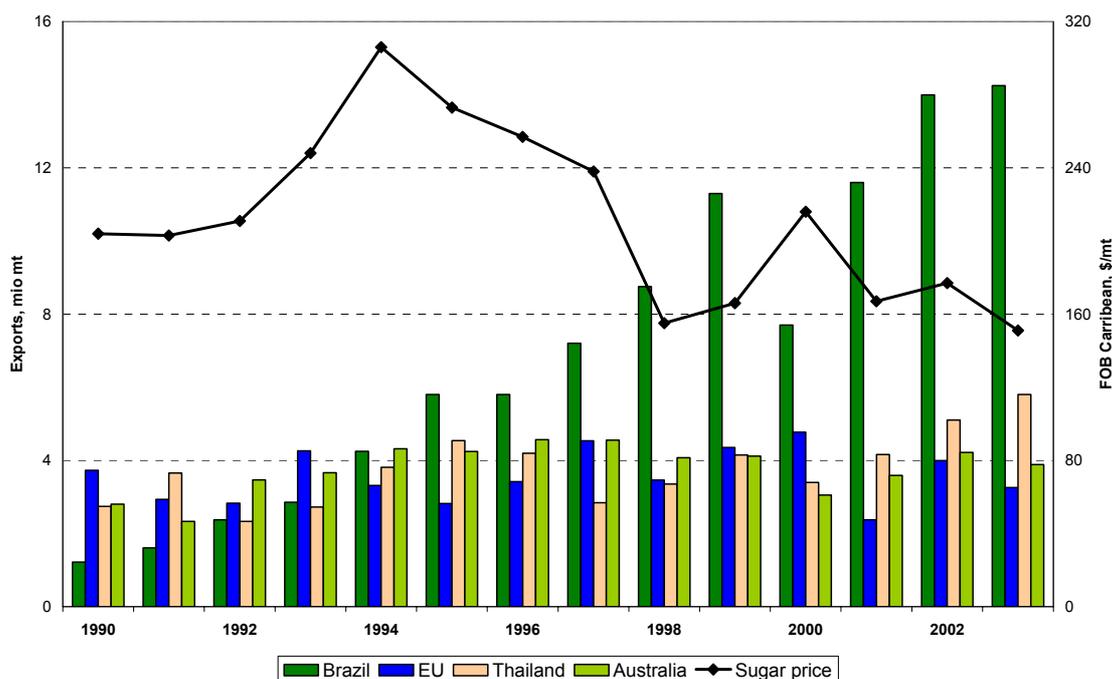
**Graph 6.2 Sugar (raw equiv.) production 1980-2004, main sugar producers**



World sugar **exports** are concentrated in a small group of countries that are also leading producers; sugar exports by five countries account for up to 70 % of world exports (Brazil, EU, Thailand, Australia, Cuba). Of this group, Brazil not only became the leading world sugar producer, outpacing the EU and India, it also became by far the largest exporter, and the rapid increase in its low-priced exports explains to a large extent the equally rapid and significant decline in world prices (see graph 6.3). The increase in world sugar exports observed since the mid 1990s reflects the dynamism of Brazilian exports. In 2004 Brazil accounted for one third of world exports. Cuba used to be the leading exporter until the collapse of the FSU. Since then, its exports have sharply declined, falling below 2 mio mt. Thailand, Australia and the EU each export an average 4 mio mt (figure for net exports), the ranking depending on years.

**Imports** are less regionally concentrated, with the Russian Federation remaining by far the biggest importer (more than 5 mio mt). Japan, the U.S and Canada are net importers of between 1 and 1.5 mio mt, and China, despite its changing net trade position, is generally a net importer. Finally the EU, despite being a net exporter, also imports significant amounts of sugar, mostly under preferential agreements.

**Graph 6.3 What drives world sugar prices?**



*Outlook 2005-2014*

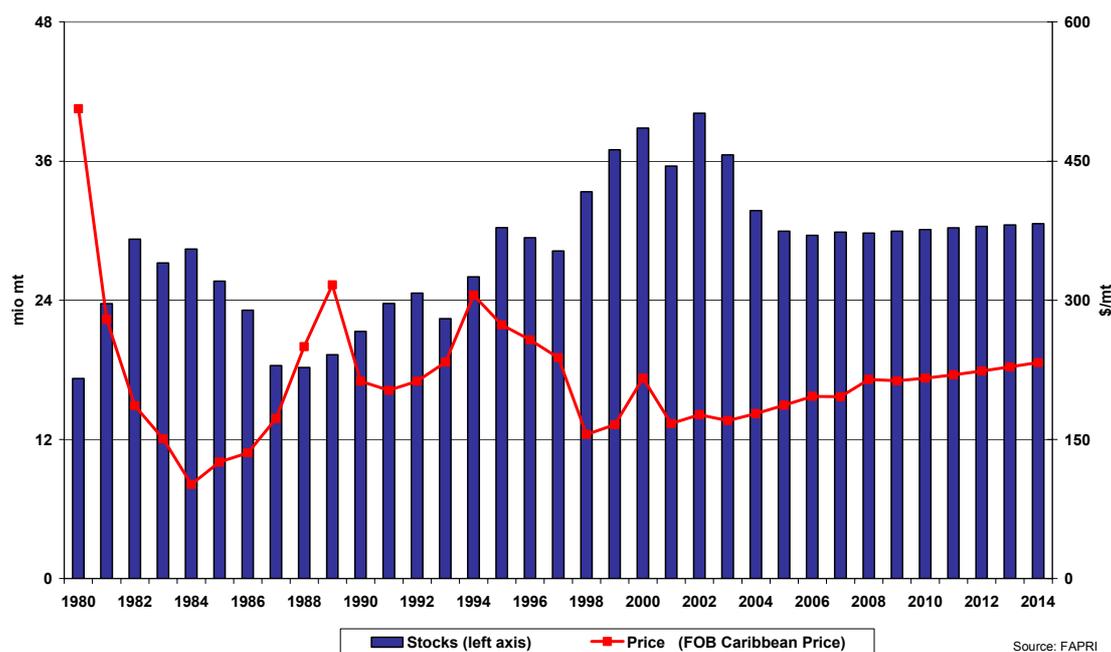
**Table 6.2 Outlook for world sugar markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 68                | 69                 | 68             |
| 1990/92 (FAOSTAT)  | 83                | 82                 | 72             |
| 2000/02            | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | <b>121</b>        | <b>122</b>         |                |
| 2010/12 (FAPRI)    | <b>118</b>        | <b>122</b>         | <b>125</b>     |

FAPRI and OECD foresee a sustained expansion in production and consumption, estimated at more or less + 20 % compared to 2000-2002. FAPRI expects production and demand to be balanced, while OECD forecasts a surplus of production over demand. However, according to OECD, the stock-to-use ratio is set to improve hence the impact on prices would be limited. Prices would nevertheless decline, both in nominal and real terms. According to OECD, the indicator for world prices<sup>3</sup> for raw sugar is expected to stay within a band of 165-195 \$/mt (7-9 cents/label) over the outlook period. FAPRI is more optimistic, as it expects a slight increase in nominal terms, as illustrated in graph 6.4.

<sup>3</sup> N) 11 contract, New York Exchange, FOB Caribbean.

**Graph 6.4 World sugar stocks and prices, 1980-2014**



In addition to Brazil, India and to a lesser extent China account for key players in enhanced **consumption**.

On the **import** side, Russia would more or less maintain its 2000-2002 level. OECD sees China as the second largest world importer.

**Brazilian production and exports** are expected to go on expanding. OECD considers that the rate of growth in production and exports will be somewhat lower than that of the last decade. The increase in ethanol demand is not expected to substantially affect the growth in sugar production and exports, as basic factors (land, investments, exchange rate and profitability) remain favourable to sugar exports (the OECD projections take into account growth prospects for the Brazilian ethanol sector, see box). Both OECD and FAPRI estimate that Brazil will be able to export more than 20 mio mt of sugar by 2009. According to OECD, exports would even go beyond 25 mio mt (while FAPRI remains close to 20 mio mt).

By comparison with Brazil, **exports from other countries** would be limited. Thailand and Australia would come close to 5 mio mt. The net exports of the EU would decline below 0.5 mio mt, as a combined result of WTO constraints on subsidised exports and increased imports, following the full implementation of the duty and quota free access for least developed countries. One major factor unaccounted for in this outlook is the impact of the EU sugar reform. With the EU expected to become a net importer of sugar after the reform, it remains unclear to what extent the drop in EU exports will result in higher prices and/or higher Brazilian exports - a topic for considerable debate and analysis in the years to come.

## **Biofuels**

The 2005 OECD projections take into account increases in biofuel production and uses for two countries: Brazil and the US.

In the case of the US, biofuel is mainly obtained from maize, but new developments are planned for biodiesel out of oil. The inclusion of growth prospects for the US biofuel sector into the OECD projections implies enhanced domestic uses of grains and oils. However, the impact on world market is rather limited (lower US exports of grains and oils, higher exports of meals than under a zero-growth scenario for biofuels).

By contrast, if the growth in ethanol production and uses would not have been taken into account in the case of Brazil, the outlook for world sugar markets would look more bearish. Brazilian sugar exports would even be higher, the OECD estimates that they would come close to 40 mio mt by 2014. As a result, world sugar prices would be 40 % lower than forecasted under the 2005 outlook.

The OECD analysed alternative scenarios for biofuels in separate studies. In particular, they assessed a scenario where growth prospects for the EU and for Canada were added to those already taken into account for Brazil and the US. These four countries represent a major share (80 %) of the current production potential for biofuels, but there are also prospects for growth in other parts of the world (especially in Asia and in other Latin American countries). The inclusion of the EU and Canada into the biofuel growth scenario brings about noticeable changes in the outlook for the grain, the oilseed and the sugar sectors. The most spectacular impact is on vegetable oils prices. The implementation of the new EU legislation promoting the use of biofuels in transportation will increase uses of both biodiesel and bioethanol. As regards sugar, the increase in sugar beet uses for bioethanol production in the EU would reduce exports and enable a small increase in world prices.

FAPRI is also further analysing developments in the biofuel sector.

## 7. COTTON

**Cotton** has received much attention in recent years for farm policy reasons, yet little of this has focused on the major transformation in cotton markets. While world production, uses and trade of cotton lint remained fairly flat throughout the 1990s, they have significantly increased since 2000 and will further expand following the end of the multifibre agreement in 2005. China is the leading producer and user of cotton lint and its net trade position has a direct impact on world prices. It is expected to remain a key net importer, as well as some other Asian countries, while the US and Africa will remain key exporters.

### *Developments since 1980*

Cotton, about a third of which is produced by developing countries, is grown both for seed and for fibre, with lint content ranging from 30 % to 40 % and seed from 55 % to 65 %. Here we consider only cotton lint, except for areas and yields.

**Table 7.1 Evolution of world cotton lint markets (mio mt)**

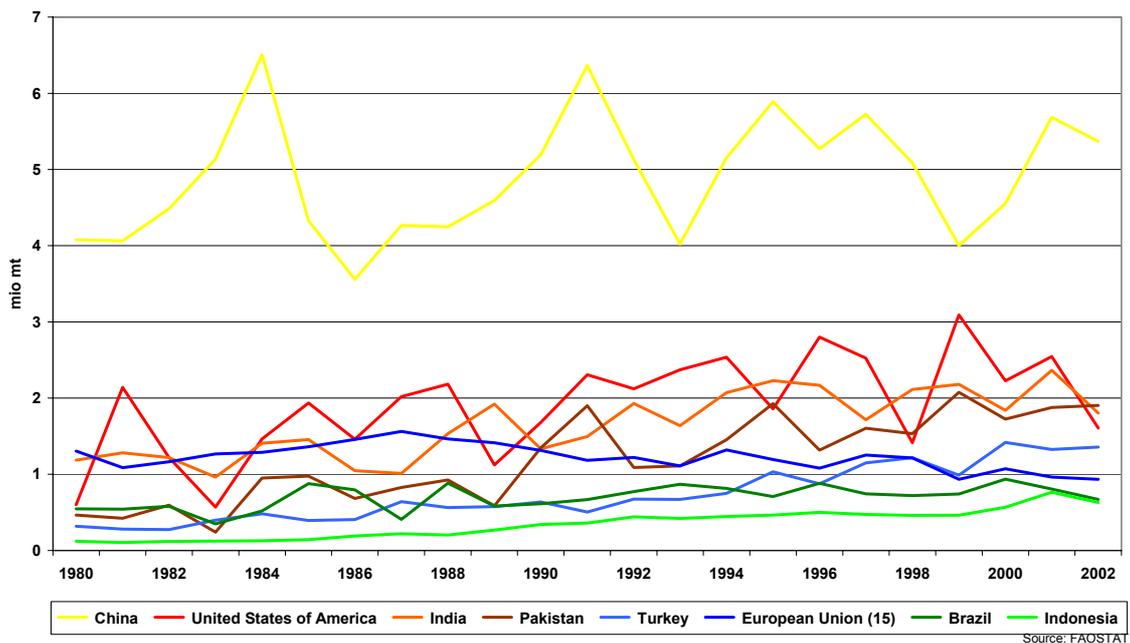
|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 15                | 15                 | 4              |
| 1990/1992 | 19                | 19                 | 5              |
| 2000/2002 | 19                | 19                 | 6              |

World production and use of cotton lint stayed around an average of 20 mio mt throughout the 1990s. Noticeable increases have been observed since 2003.

The **consumption** pattern of cotton is determined by the size of the textile industries of the dominant cotton consumers. China, the leading textile producer, currently consumes more than one-third of global cotton output. Other major textile producers are India, Pakistan, Turkey, and the U.S which, together with China account for more than two-thirds of global cotton consumption. World use of cotton has been increasing at roughly the rate of world population growth and as a result the per capita consumption of cotton fibres has stagnated. In contrast, world use of synthetic fibres has been increasing. The result is that cotton now represents only 40 % of world fibre use compared to 60 % in 1960. However, lint use has re-emerged and has been a driving force in the strong commodity growth seen since 1998.

Since 1980, Chinese cotton use has oscillated between 4 and 6 mio mt. In other leading countries, uses have globally increased since 1980, reaching 2 mio mt for India and Pakistan, 1.2 mio in Turkey and close to 1 mio in Indonesia. Cotton consumption in the U.S has increased since 1980. In recent years, it fluctuated between 1.5 and 3 mio mt, while lint use in the EU has been on the decline. Latin America has shown a modest increase in uses in Brazil, while Africa, the continent that has received most attention of recent, has been stable.

**Graph 7.1 Main cotton lint consumers, 1980-2002**

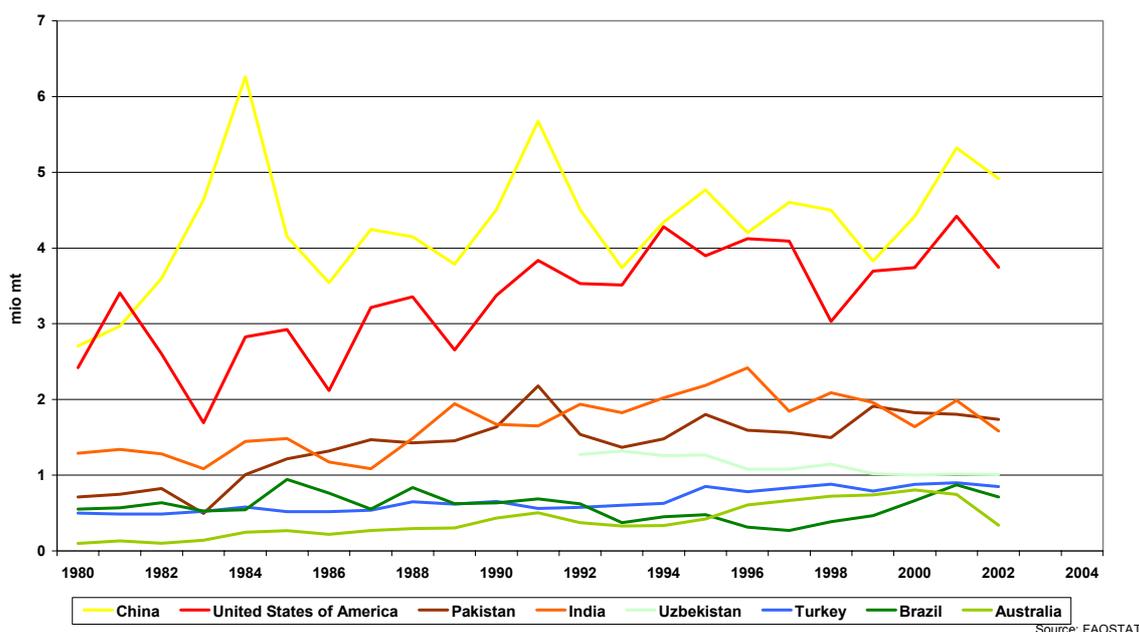


World **production** followed similar patterns to consumption, albeit with more market fluctuations. In the early 2000 years, production oscillated around 20 mio mt. Since 2003 it has shown an unprecedented increase (see graphs 7.2 and 7.4).

Although **area** has declined since the eighties, the fact that growth in production has continued can mainly be attributed to **yield** enhancement. The link with the rapid take up of Genetically Modified (GM) cotton is not straightforward. The top-3 world producers (China, US and India) use GM cotton, however, yields show contrasting developments. Uses of GM seeds have developed on a commercial basis from 1996 onwards in the US and they currently account for 80 % of plantings. The average yield indicated in the FAO data base for the US has not increased significantly since then. In some regions, GM cotton enabled an improvement in yields, in others not. In the case of insect resistant cotton this depends on the degree of infestation. The same applies for China, where GM cotton was introduced in 1998/1999. No overall increase in yield can be evidenced for regions having sown GM cotton. Though, the average yield indicated for Chinese cotton in FAO has increased since the 1990s. This can be explained by overall improvement in growing conditions. GM cotton is also grown in Australia, South Africa, Mexico and Argentina (since 1998/1999) as well as in India (since 2002).

Asia dominates cotton lint production, with Chinese production showing large fluctuations. It peaked at more than 6 mio mt in the mid 1980s, but in recent year's production ranged between 4 and 5 mio mt. Between 1992 and 1999, areas under cotton in China have declined, but yields have improved. Indian production increased until 1996, in parallel with an increase in the area under production, while yields remained low. Since then it has declined, falling to below 2 mio mt. In North America, US cotton production reached a plateau of 4 mio mt in the mid 1990s, and since then has fluctuated around this level. Developments in production seem to be in line with those of areas and yields have not significantly improved.

**Graph 7.2 Main cotton lint producers, 1980-2004**

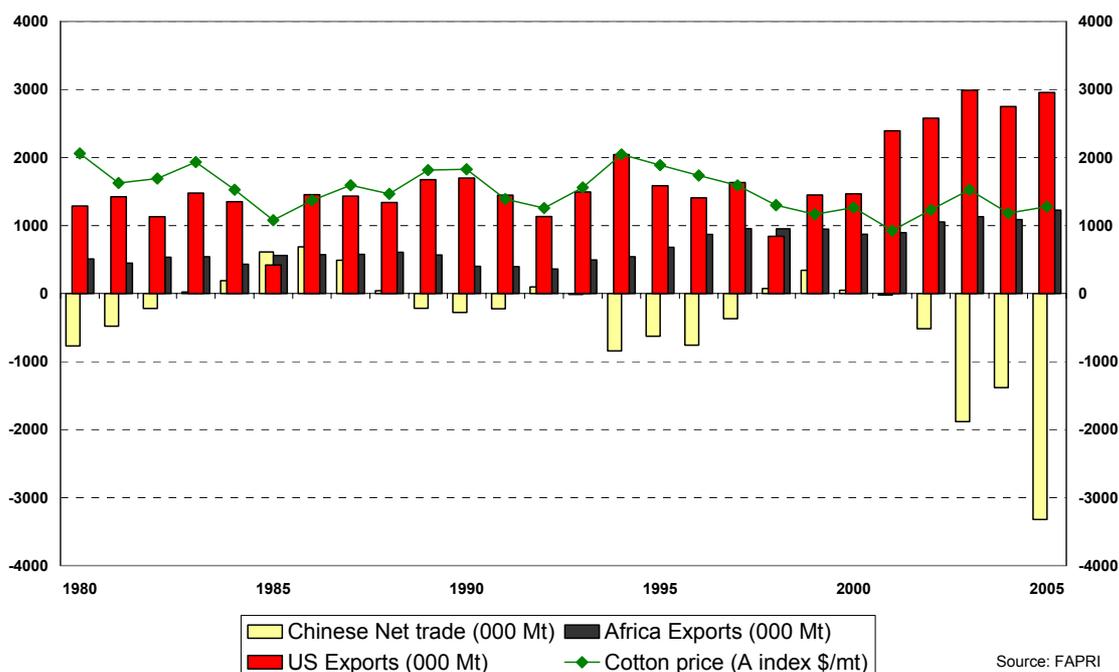


In the early 1990s, African production exceeded Latin American production, and further increased in the mid 1990s, achieving annual growth rates of more than 3 %. This was driven mainly by area growth (yields have remained flat).

In Latin America, on the other hand, production dropped in the early 1990s and has been limited to 1 mio mt since then. However, Brazilian production could be on an increasing trend as a result of a spectacular improvement in yields, which increased by 2.5 times between 1997 and 2004. Australia overtook the EU-15 in the mid 1990s, having been a producer of similar magnitude for years. EU production increased, but with levels standing at around 0.5 mio mt of cotton lint, it plays only a minor role in world production.

**World cotton markets** are characterised by significant price fluctuations, mainly driven by the great variability of use in China, the leading world user of cotton. As graph 7.3 demonstrates, the world cotton prices (measured here by the A index compiled from the average of daily quotes of traded cotton) is related to changes in Chinese net trade. When China switches to a net importer, prices increase. Conversely, when it turns to a net exporter prices decrease. There is a link with changes in stocks. Before turning to imports China used its domestic stocks. Given its weight in world uses this led to an increase in world prices. Graph 7.3 also shows two other players that have received attention in recent years, the US and Africa. US exports have been expanding rapidly in recent years, mainly as a result of the decline of domestic use of cotton, and are now approaching 3 mio mt. African exports have risen since the late 1990s, to exceed 1 mio mt.

**Graph 7.3 What drives cotton markets?**



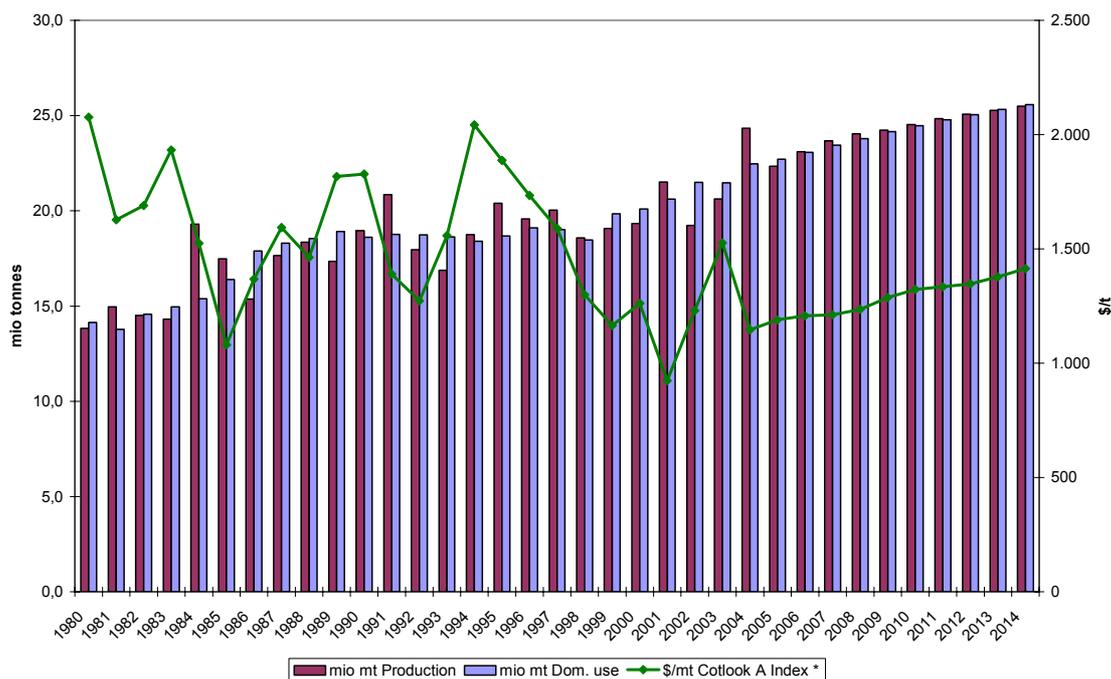
World trade expanded in the late 1980s as a result of the emergence of Uzbekistan as an exporter. And, although in the 1990s trade declined, it has increased dramatically since 2001, as a result of enhanced US exports and China's return to a net importing position.

Other exporters include the five Central Asian republics of the FSU (with Uzbekistan as the biggest player), and to a lesser degree Australia. The EU both exports and imports cotton lint. Although its imports have dramatically dropped as a result of the decline in the textiles industry, it remains a net importer. (Average net imports of 0.5 mio mt). Indonesian imports ranged between 0.4 and 0.6 mio mt. As a result of a steady growth Turkish, Mexican and Russian imports all reached a level close to 0.4 mio mt. Finally Brazil, a net importer over the 1990s, has turned to small net exporter since 2000.

#### *Outlook 2005-2014*

Graph 7.3 shows long term developments in cotton lint and uses, including the outlook up to 2014, as established by FAPRI. Before considering projections, it is useful to summarise developments in recent years. After the drop in 2002, production resumed growth and reached a record level of 25 mio mt in 2004. Although this was higher than uses, the drop in price was limited because uses have increased as well, and are forecast to continue growing over the medium term (+ 23 % in 2010/2012 compared to 2000/2002). Production is foreseen to anticipate this (+ 27 %). Stocks would stabilise but still represent 40 % of uses. Prices would remain close to 1.300 US\$/t.

**Graph 7.4 Developments in cotton lint production and uses (past and outlook)**



**Table 7.2 Outlook for world cotton lint markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 76                | 76                 | 76             |
| 1990/92 (FAOSTAT)  | 99                | 98                 | 89             |
| 2000/02            | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (FAPRI)    | <b>127</b>        | <b>123</b>         | <b>142</b>     |
| 2010/12 (USDA)     | -                 | -                  | <b>128</b>     |

Trade is expected to boom, following the end of the multifibre agreement. The main importers are China and other Asian countries and the main exporters, the US and Africa.

USDA and FAPRI forecasts are not directly comparable, as there are differences in variables. USDA considers gross trade in all cotton while FAPRI figures refer only to net trade in cotton lint. USDA sees the US as the leading exporter (all cotton) by 2011 while FAPRI expects US cotton lint exports to be lower than Africa's. Brazil would return to net importer status under the USDA forecasts, but remain a growing net exporter of cotton lint according to FAPRI. Based on the latter's projections, India would also switch to a net exporter in 2006 and consolidate this position. On the import side, the USDA figure for China (all cotton) is also much higher than that of FAPRI. According to the latter, the growing demand in China will be met in part by increased Brazilian production and exports.

## 8. MEATS

### 8.1. Beef

**Beef** has been the least dynamic of the livestock sectors over the last twenty years. Moreover, production and consumption have been repeatedly disrupted by animal diseases such as BSE and FMD in various regions of the world. Beef and veal consumption and production is projected to grow considerably faster than it has over the past decades. Trade is also projected to expand and represent around 10 % of world production. The EU, which was the main beef exporter in the 1990s, became a net importer in 2003 thanks to continued reductions in its herd size and projections suggest the EU's beef trade deficit will increase in coming years. Brazil is expected to be the world's largest beef exporter and could more than double its current exports (0.8 mio mt) by 2014.

#### *Developments since 1980*

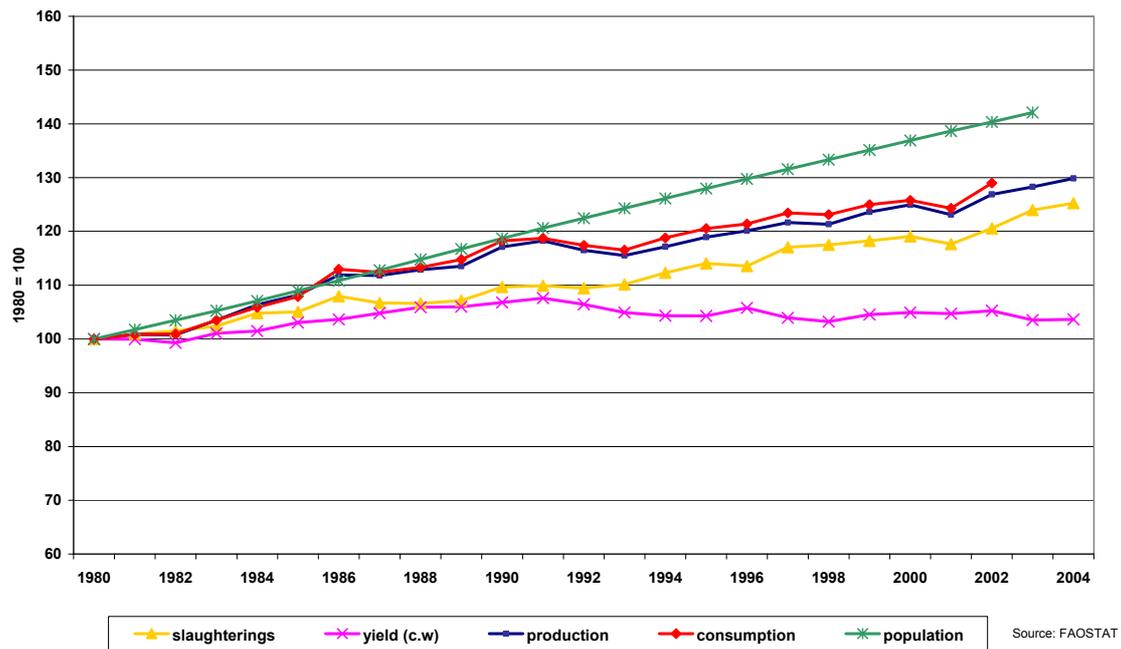
Beef has been the least dynamic of the livestock sectors over the last twenty years. Moreover, production and consumption have been repeatedly disrupted by animal diseases such as BSE and FMD in various regions of the world.

**Table 8.1 Evolution of world beef markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 46                | 47                 | 3              |
| 1990/1992 | 53                | 55                 | 5              |
| 2000/2002 | 57                | 59                 | 6              |

World beef **consumption** grew at an average annual rate of 1.2 % in the 1980-2002 period, although this was far greater in the first half of the period (1.4 % p.a.) than the second (0.9 % p.a.). Overall however, this is slower than the increase in world population, meaning that world per-capita consumption has in fact decreased. Graph 8.1 compares indexed consumption (and production) with the development of world population and shows that the turning point was 1990/1991. Until that year, consumption and production had been stable for more than a decade and had evolved in line with population growth, after which growth rates dropped and per capita consumption decreased.

**Graph 8.1 World beef and veal growth, 1980-2004**

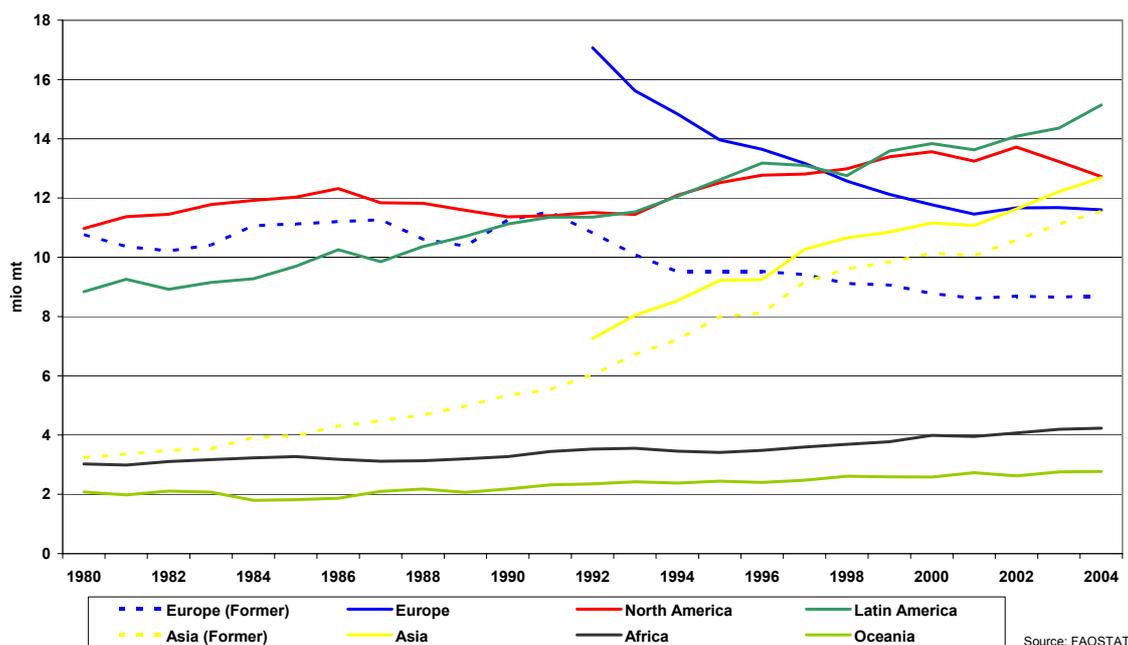


A regional breakdown of consumption reveals this structural change more clearly. European consumption dropped sharply after 1991 following a sharp reduction in beef production and consumption in the former German Democratic Republic (GDR) after German reunification and the economic repercussions of the collapse of the FSU. At the same time, Asian consumption took off and continued to grow rapidly.

Despite this strong growth however, Asian per capita consumption is still very low (even lower than Africa's). North American per capita consumption is ten times higher, Europe's four times. This implies that there is still considerable growth potential for the beef sector in Asia.

Driven by consumption, world beef **production** followed a similar pattern. World beef consumption and production currently (2000-2002) stands at almost 60 mio mt. World figures, however, mask two dramatic regional changes since the early 1990s: firstly, the sharp drop in production in Europe, especially between 1992 and 2002 (-3.2 % p.a.), and secondly, the strong growth rate in Asia (4.8 % in 1992-2002) and, though less pronounced, in Latin America (graph 8.2).

**Graph 8.2 Beef and veal production 1980-2004, main regions**



Asia's production was mainly driven by **China**, whose production has grown at around 10 % over the last quarter of a century. China's beef production, which was negligible in 1980, now comes close to that of the EU-15.

The world's largest beef consuming and producing country is still the **USA**, which has seen moderate growth in both consumption and production over the last quarter of a century. Beef exports from the USA and Canada have been facing serious problems for two years due to the discovery of BSE.

In 2000-2002, **Brazil** was the second largest beef producer, and third largest consumer. The EU-15 was the third major producer and ranked second in consumption. However, if China maintains its recent growth rates, it will soon overtake the EU.

#### *Outlook 2005-2014*

Beef and veal **consumption and production** is expected to continue its steady growth and could increase to about 73 mio mt (OECD) in 2014/2015, up 14 mio mt from the 2000-2002 value. This corresponds to an annual growth rate of 1.5 % to 1.6 % for the forecast period 2005-2014. OECD therefore expects world beef consumption and production to grow considerably faster than it has both over the past decade (0.9 %, see above) and the one previous to that (1.4 %). Although FAPRI does not publish forecasts for world consumption and production, if its consumption and production figures for all countries are summed up, it seems that it is as optimistic as OECD for the world beef sector. Both predict consumption and production to increase at around 1.6 % between 2005 and 2014, largely because of growing demand in Asia.

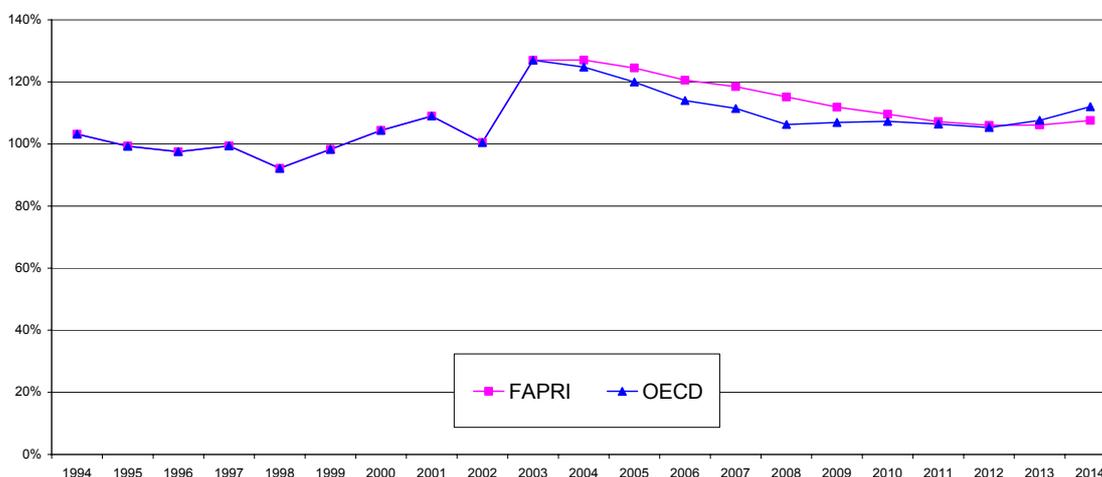
**Table 8.2 Outlook for world beef markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 80                | 80                 | 54             |
| 1990/92 (FAOSTAT)  | 94                | 93                 | 78             |
| 2000/02            | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | <b>117</b>        | <b>118</b>         | <b>122</b>     |
| 2010/12 (FAPRI)    | <b>116</b>        | <b>116</b>         | <b>147</b>     |
| 2010/12 (USDA)     | -                 | -                  | <b>121</b>     |

Total **exports** could increase from 5.6 mio mt (2000-2002) to 7.0 mio mt in 2014/2015, according to OECD, which means that the share of beef traded would remain at slightly below 10 %. FAPRI sees a slightly higher increase in absolute terms, but has lower figures throughout the forecast period, which explains the much higher relative increase in world beef trade in the table above. The latter institution works with net-trade for all countries and includes the net-importing USA in the “exporter” category, which results in lower world net exports. According to FAPRI, world beef exports could increase from about 3.5 mio mt in 2000-2002 to about 5.3 mio mt.

By 2014, nominal beef **prices** (1994-1996 = 100) are likely to drop back from their current relatively high level (125 %) by around 20 %, according to both projections.

**Graph 8.3 Beef price (1994/1996 = 100)**



**Brazil** is expected to be the world’s largest beef exporter and could double its exports from 0.8 mio mt in 2000-2002 to 1.6 mio mt (OECD) or even 1.8 mio mt (FAPRI) in 2014. A major threat is the recent outbreak of FMD in Brazil, which could substantially lower its export prospects in the near future. Brazil’s consumption is likely to grow at a relatively robust rate but, boosted by continued strong investments, production will increase even faster. **Australia**’s production is likely to decrease and this will lead to shrinking exports: OECD forecasts 1.0 mio mt in 2014, down from the current 1.3 mio mt. FAPRI on the other hand,

expects Australia to increase its exports to about 1.6 mio mt. OECD and FAPRI predict **Argentina**, which obtained the valuable “FMD-free without vaccination” status early this year, to double its exports from 0.3 mio mt to 0.7 mio mt (FAPRI 0.8 mio mt) due to higher production and only slowly growing consumption. **India** will see very high growth rates in both consumption and production. Nevertheless, buffalo meat exports are forecast to double from 0.3 mio mt to 0.6 mio mt (OECD) or 0.7 mio mt (FAPRI).

The two institutions agree that the **EU-25** will switch from a net exporter, as it has been in the recent past (0.2 mio mt) to a net importer of about 0.4 mio mt (OECD) or 0.3 mio mt (FAPRI). The main reason for this is the structural downward adjustment of dairy cattle numbers and the decoupling of payments which will reduce incentives to suckler cow herds. As exports will occur at the same time, EU imports are therefore expected to remain higher than the 0.2 mio mt tariff quota throughout the forecast period. The **USA** (and Canada) which currently face export problems due to BSE, are forecast to resume beef exports to Asian markets in 2006, as their trading partners are expected to lift the bans. In the longer term, this will result in the USA losing its current net-import status and the import-export balance will come close to zero by 2014, according to both forecasts. **New Zealand** and **Canada** will roughly maintain their net-exports levels (OECD) or increase exports (FAPRI).

By 2014, **China** is expected to have overtaken Brazil in terms of consumption and production, but OECD predicts China will not to take part in world beef trade. FAPRI, on the contrary, is forecasting that China will be one of the major importing countries with imports totalling 0.5 mio mt in 2014. All the main current beef importers are expected to increase their import demand: Japan, South Korea, Mexico, Russia.

## 8.2. Pigmeat

Although world **pigmeat** consumption and production ranks second to poultry in terms of recent growth, it remains the more important sector in terms of quantity (92 mio t were produced in 2000-2002). Asia is the dominant region in this sector, accounting for 56 % of world production and consumption and China is single-handedly responsible for almost half of world consumption and production. The growth of the world pork sector is projected to slow down over the next decade. The EU's share in world exports (about one third for many years) has shrunk in the recent past as Canada and Brazil have gained importance and strengthened their export position, and the USA has switched to a net-export position.

### *Developments since 1980*

World **pigmeat** consumption and production ranks second to poultry in terms of growth observed in recent history. Annual increases averaged 2.7 % during 1980-2002, with a slight slow-down from the first to the second split-period. In terms of quantity, the sector (which produced 92 mio mt in 2000-2002) is still more important than the poultry sector.

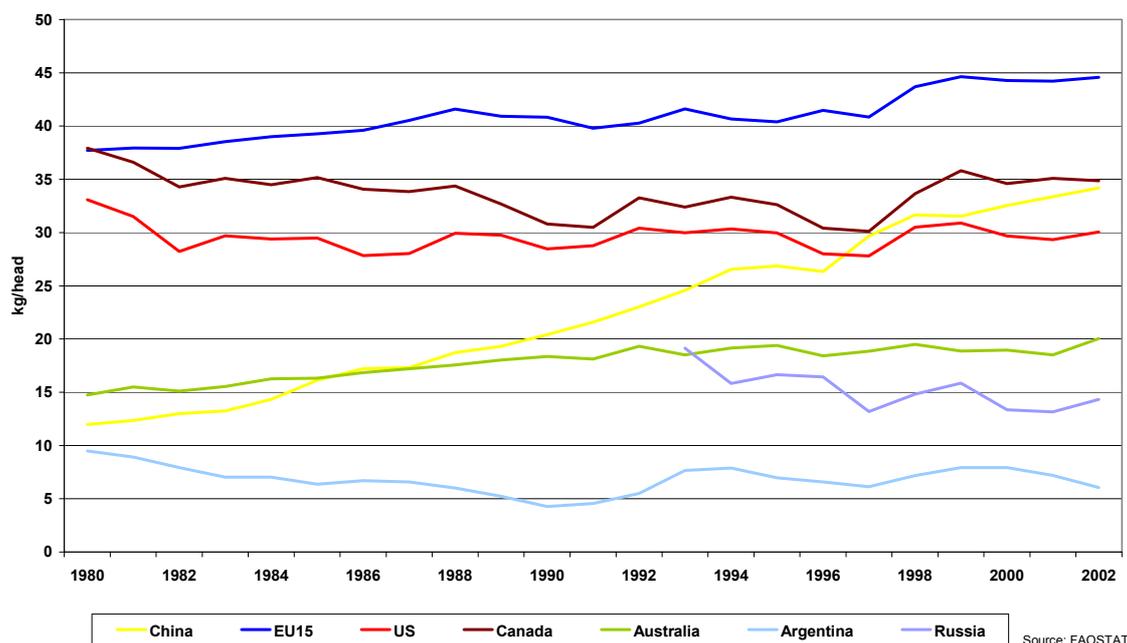
**Table 8.3 Evolution of world pigmeat markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 53                | 53                 | 1.1            |
| 1990/1992 | 72                | 72                 | 1.7            |
| 2000/2002 | 92                | 93                 | 3.5            |

Asia is the dominant region in this sector: it accounts for 56 % of world production and consumption and one single country, China, is responsible for almost half of world consumption and production.

**Consumption** has been stagnating in Europe over the last decade and only slightly increasing in North America, the third principal pigmeat consumer. In Europe two opposite trends could be observed in 1992-2002: modestly increasing production and consumption in the EU-15 and declining production and consumption in Russia and Ukraine. Thus, the increase in world demand (2.7 % annually over 1980-2002) was mainly driven by Asian consumption (+ 5.7 % annually). China's per-capita consumption of pigmeat has meanwhile reached the level of North America's which is an indication that the growth of consumption may slow down.

**Graph 8.4 Pigmeat per capita consumption 1980-2002, some selected countries**



Essentially, pigmeat **production** takes place where demand is located, and the increase in production takes place, where demand grows: in Asia. On this continent, growth in pigmeat production (4.4 % p.a. in 1992-2004) matched almost that of consumption and outpaced by far the expansion observed elsewhere in the world. The share of pigmeat traded is below 5 %, even less than that of poultry meat.

The EU's share in world **exports** has been at about one third for many years but fell back in the recent past as Canada and Brazil gained importance and the USA switched from being a net-importer to a net-exporter. From 1992-2004 the increase in production, especially in Canada and Brazil, outpaced their respective consumption, strengthening their export positions.

Major **net-importers** are Japan (1.0 mio mt in 2003) and Russia (0.5 mio mt) followed by Mexico (0.3 mio mt) and South Korea. Only relatively recently, China incl. Hong Kong has built up a small net-import position (FAPRI, FAOSTAT). OECD however, registers China as net-exporter.

#### *Outlook 2005-2014*

Both, OECD and FAPRI, forecast that growth of the world pigmeat sector will slow down to about 1.6-1.7 % p.a. in 2005-2014. The main reason is China's reduced growth potential. On global pigmeat trade, FAPRI is expecting a considerably more dynamic development than OECD.

**Table 8.4 Outlook for world pigmeat markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 57                | 57                 | 32             |
| 1990/92 (FAOSTAT)  | 78                | 77                 | 50             |
| 2000/02            | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | <b>123</b>        | <b>122</b>         | <b>144</b>     |
| 2010/12 (FAPRI)    | <b>122</b>        | <b>122</b>         | <b>158</b>     |
| 2010/12 (USDA)     | -                 | -                  | <b>148</b>     |

The **USA** is expected to have a very moderate growth in both pigmeat consumption and production, the latter being slightly higher than the former, which will result in net exports increasing from current levels of about 0.4 mio mt to about 0.6 mio mt (FAPRI) or 0.5 mio mt (OECD) in 2014.

**Brazil's** net exports are expected to reach 1.0 mio mt mark in 2010, up from the current level of 0.5 to 0.6 mio mt, and to stagnate after this, according to FAPRI. Both, production and consumption are expected to continue their robust growth. OECD is predicting higher increases in domestic consumption and consequently lower exports, stabilising at about 0.7 mio mt.

Both FAPRI and OECD expect expansion of production and consumption in **China** to slow down to about 2 % p.a. in 2005-2014 from rates of almost 5 % in 1992-2002. This seems plausible, given the high per capita consumption already attained. According to FAPRI, China incl. Hong Kong could strengthen its net-import position. (OECD does not provide any estimate on China's imports and, thus, on its net-trade, but in the text of OECD's "Agricultural Outlook 2005/2014" China is addressed as a net-exporting country).

FAPRI forecasts **EU-25's** net exports to stabilise at 1.3-1.4 mio mt throughout 2005-2014, which would be a slight increase from the 2004 value. OECD expects a rather slow but steady increase of net-exports to almost 1.5 mio mt, which should allow the EU to maintain its status as the largest exporter. Production and consumption will show very moderate increases according to both institutions.

Robust growth of production and moderate growth of consumption will boost **Canada's** pigmeat net-exports to 1.2 mio mt from current levels of 0.8-0.9 mio mt, according to FAPRI. OECD, on the other hand, sees no potential for further growth in production and, due to modestly increasing demand, exports could slightly decline.

**Japan's** stagnant consumption is predicted to cause stagnant production which together will result in slightly increased imports. FAPRI forecasts 1.5 mio mt and OECD 1.4 mio mt in 2014.

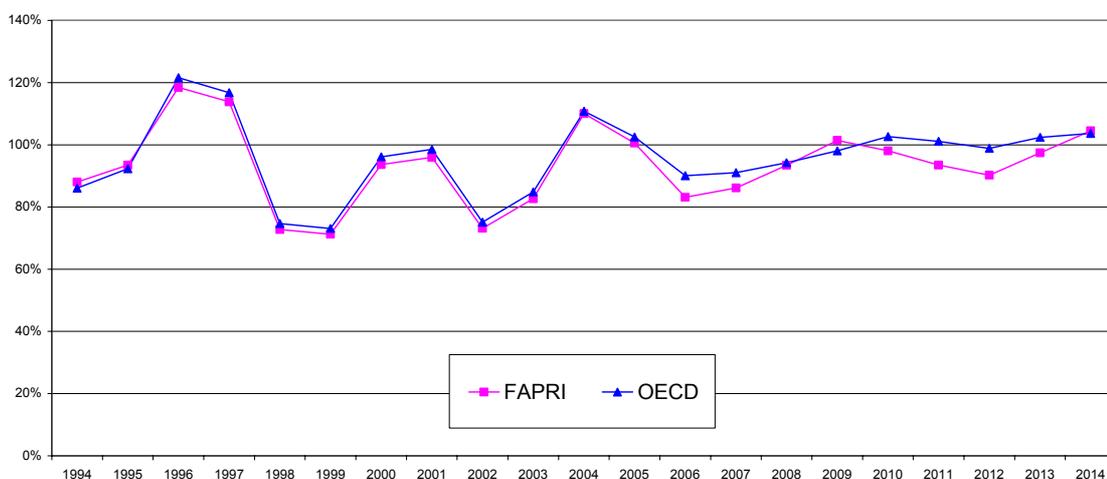
Consumption and production are likely to grow at a robust pace in **Mexico**, and import demand will increase to 0.5 mio mt (FAPRI) or 0.4 mio mt (OECD) by 2014.

After the decline in **Russia's** pigmeat production and consumption came to a halt at the end of the nineties, the sector has been growing ever since. The country is expected to see higher increases in production than in consumption, leading to

slightly reduced imports. FAPRI is projecting 0.4 mio mt in 2014. For OECD, Russian production will keep pace with growing consumption, and Russia will therefore maintain its current net-import position.

The **price** prospects for pigmeat are rather unspectacular, according to both institutions. The US pigmeat price is forecast to drop from the high level observed in 2004. This peak was caused by consumers switching to pigmeat following the Avian Influenza scare and the discovery of BSE in North America. Prices will experience a rather abrupt drop, but are expected to steadily recover from 2006 and should have regained about half the amount lost by 2014.

**Graph 8.5 Pigmeat price (1994/1996 = 100)**



### 8.3. Poultry

The **poultry** sector has been the most dynamic meat sector in the past 20 years. Having experienced strong growth and overtaken the beef sector in the mid 1990s, it is now the second most widely consumed meat. The spread of the Avian Influenza has the potential to cause the first major disruption for the world poultry sector, with significant negative impacts on the feed cereals and oilseeds/oilmeal markets. Brazil's production grew faster than its consumption over the period under consideration and in 2002-2004, its production levels were close to those of the EU-15 at almost 9 mio t. Thailand has also established itself as an exporter with a net-trade comparable to, or even higher than that of the EU-15. Major importers are Russia and Japan, followed by Saudi Arabia and Mexico. Poultry consumption and production is projected to increase at slightly more than 2 % annually from 2005-2014, less than half the rate observed over the past two decades. Trade in poultry meat is likely to increase faster than production and consumption.

#### *Developments since 1980*

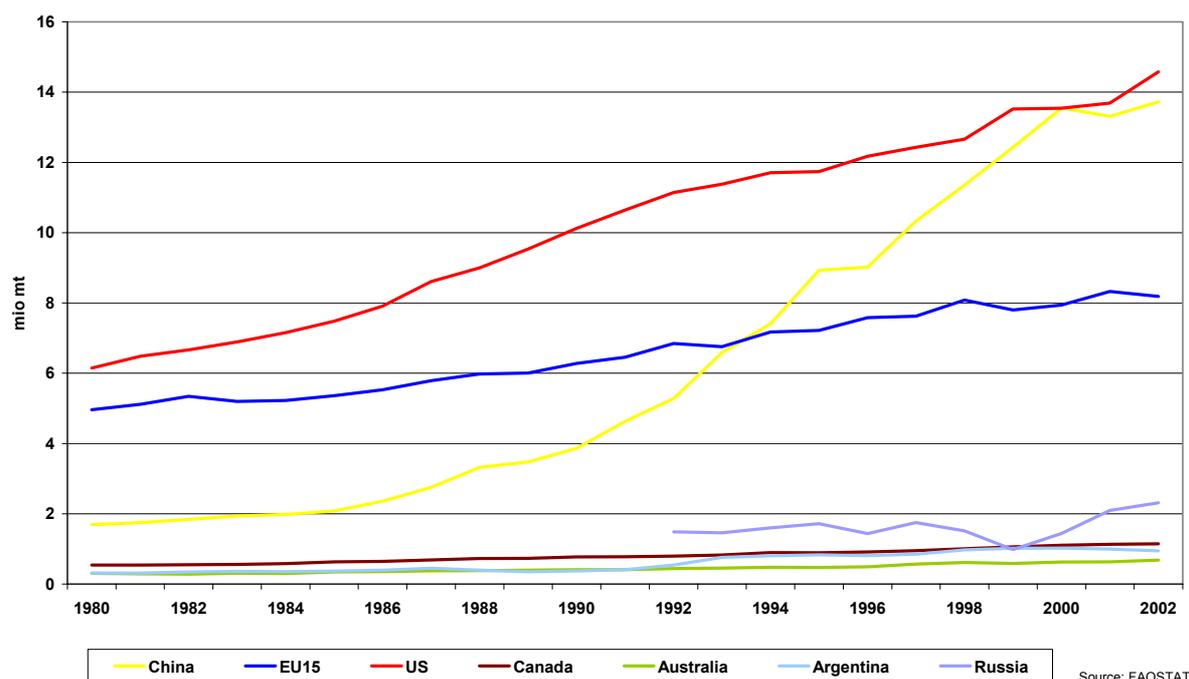
Within the world meat sector, the **poultry** sector has been the most dynamic. Having experienced strong growth and overtaken the beef sector in the mid 1990s, it is now the second most widely consumed meat and the quantities consumed and produced globally equalled roughly 72 mio mt in 2000-2002.

**Table 8.5 Evolution of world poultry markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 27                | 27                 | 1.3            |
| 1990/1992 | 43                | 43                 | 2.1            |
| 2000/2002 | 72                | 71                 | 7.9            |

The average growth rate of **consumption and production** has been almost 5 % p.a. over the last quarter of a century without any slowdown from the first sub-period (1980-1992) to the second (1992-2002). Per-capita consumption increased consistently all over the world and no major disruptions occurred at either global or regional level. The spread of the Avian Influenza has the potential to cause the first major disruption for the world poultry sector, with significant negative impacts on the feed cereals and oilseeds/oilmeal markets. Growth rates have been especially high for Asian and Latin American consumption and production and lower in Europe and North America. The latter two regions also exhibited a significant slowdown in expansion of the poultry sector in 1992-2002, but still positive annual increases. In absolute terms, Asia accounts for roughly one third of world consumption and production. Following growth rates of about 10 % over the last two decades, China's poultry meat consumption has reached a level close to that of the USA, totalling almost 14 mio mt in 2000-2002 (see graph 8.6).

**Graph 8.6 Poultry consumption 1980-2002, some selected countries**



Nevertheless, China's per-capita consumption is still low - only half the EU-15's or one fifth of the US - and has thus considerable potential to grow further.

In most cases, regional production pattern follows that of consumption. This is reflected in the relatively small share of poultry meat traded in total consumption. EU exports have been oscillating at or below the 0.5 mio mt mark for more than two decades, meaning it has lost relative importance in trade, given that world trade in poultry meat is now four times the quantity traded twenty years ago. The USA, traditionally the most important exporter with exports fluctuating in the 2-3 mio mt range for several years, has lost market share to Brazil, now the second exporter, in the recent past. Brazil's production grew faster than its consumption over the period under consideration and in 2002-2004 it was close to EU-15 production levels of almost 9 mio mt. In Asia, Thailand has established itself as an exporter with a net-trade comparable to or even higher than that of the EU-15. Major importers are Russia and Japan, followed by Saudi Arabia and Mexico.

#### *Outlook 2005-2014*

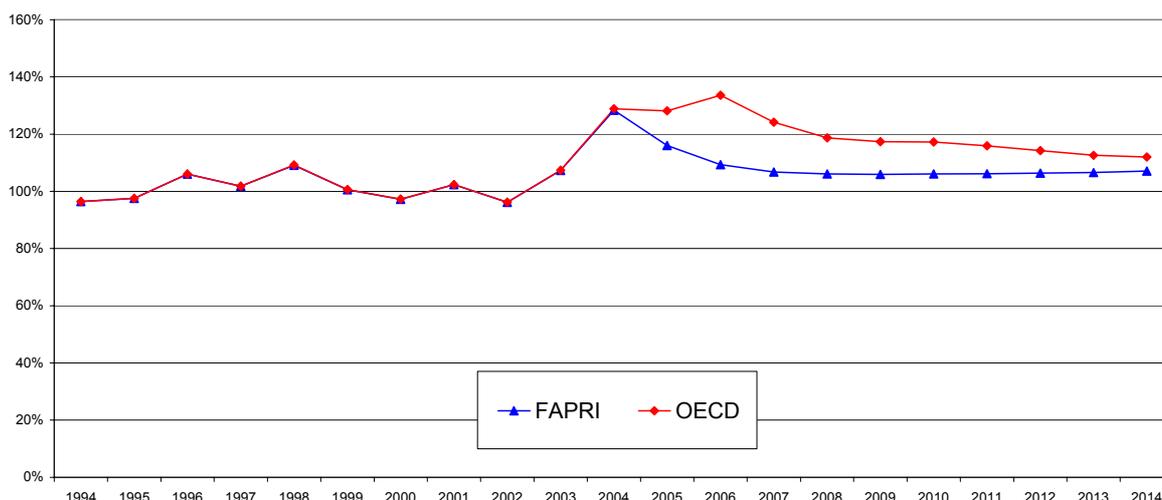
Although both forecasting institutions predict the world poultry sector to continue to experience the highest growth rates within the global meat industry, they agree that these will undergo a relatively pronounced drop. OECD and FAPRI expect poultry **consumption and production** to increase at slightly more than 2 % annually in 2005-2014, which corresponds to less than half the rates observed over the past two decades. Given the potential for further increase in per-capita consumption in Asia and Latin America, these projections may appear rather conservative.

**Table 8.6 Outlook for world poultry markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 38                | 38                 | 18             |
| 1990/92 (FAOSTAT)  | 60                | 61                 | 30             |
| 2000/02            | 100               | 100                | 100            |
| 2010/12 (OECD)     | 124               | 124                | 139            |
| 2010/12 (FAPRI)    | 126               | 125                | 143            |
| 2010/12 (USDA)     | -                 | -                  | 125            |

As far as the **price** prospects are concerned, FAPRI and OECD are expecting that poultry meat prices are unlikely to remain at the relatively high level observed in 2004. OECD, however, forecasts that the downward adjustment will only take place from 2007 onwards, whereas FAPRI anticipates this happening rather more immediately back to the levels of the late 1990s and early 2000s (before 2003, when the recent peak in poultry meat prices began).

**Graph 8.7 Poultry price (1994/1996 = 100)**



**Trade** in poultry meat is likely to increase at a faster pace than production and consumption, resulting in a higher share of consumption and production traded.

OECD expects the **USA** to increase poultry exports to 2.9 mio mt in 2014, up from 2.4 mio mt in 2004, as production is projected to grow faster than consumption. FAPRI sees US exports higher, at 3.2 mio mt in 2014.

Both forecasts expect **Brazil's** dynamic growth of consumption and production to slow down drastically. Whereas annual growth rates in the last two decades were around 7 %, the rates expected in 2005-2014 are from 2-3 %. OECD and FAPRI forecast Brazil's net-exports in 2014 to stand at 3.0 mio mt, compared to 2.5 mio mt in 2004. Brazil's growing internal demand will prevent it from increasing exports at the pace seen in the recent past.

According to both the OECD and FAPRI, the **EU-25** will essentially maintain its trade status, reducing net-exports slightly from 0.5 mio mt in 2004 to 0.4 mio mt in 2014.

They also agree that the strong growth of **China's** poultry sector will slow-down considerably. But whereas FAPRI anticipates a rather more "soft landing" with annual increases falling to about 3 % in 2005-2014, (down from close to 10 % in 1992-2002), OECD predicts consumption and production will virtually stagnate (which seems less plausible). China's production is expected to lag slightly behind its consumption.

For OECD, **India** is likely to appear as a net-exporter with 0.2 mio mt in 2014; FAPRI on the other hand expects India to remain out of world poultry trade.

**Thailand** will be able to strengthen its export status due to strong increases in production according to FAPRI (no OECD estimate available). All the main importers (Russia, Japan, Mexico) are forecast to import more in the future.

## 9. MILK AND DAIRY

### 9.1. Cheese

World **cheese** production and consumption have increased substantially over the last two decades, reaching around 17 mio t. Production and consumption is largely concentrated in Europe and North America, which together represent around 80 % of world production and consumption. Cheese consumption and production is expected to continue its growth and could reach around 21 mio t in 2014, although the share of cheese traded would remain below 7 %. Oceania, with less than 4 % of world production, is expected to remain the world's largest cheese exporting region and could increase its world market share to around 50 %. The EU-25 will reduce its share of the world cheese market in line with the decrease in exportable surplus following the projected increase in domestic demand and the limited production capacity linked to fixed milk quotas. Japan and Russia are projected to remain the greatest cheese importers, even though their share is set to decrease slightly over the medium term.

#### *Developments since 1980*

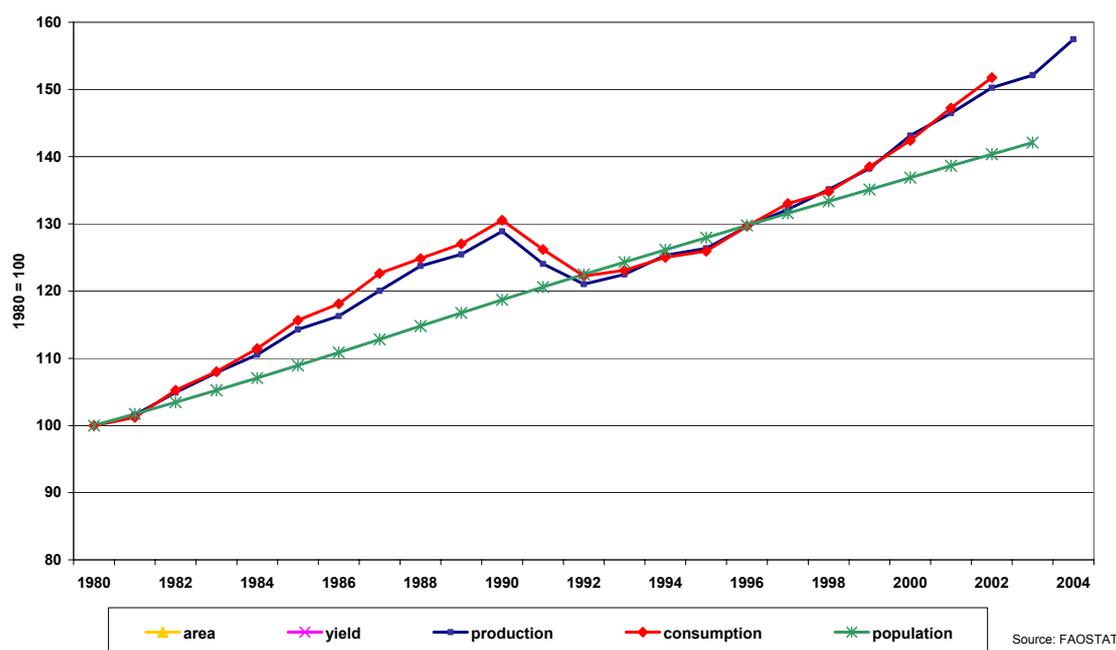
World cheese **consumption** has grown at an average annual rate of 1.9 % over the 1980-2002 period. This is slightly higher than the increase in world population, meaning that world per-capita consumption has increased over the last two decades.

**Table 9.1 Evolution of world cheese markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 12                | 12                 | 0.7            |
| 1990/1992 | 14                | 14                 | 0.8            |
| 2000/2002 | 17                | 17                 | 1.4            |

Graph 9.1 which compares indexed (1980 = 100) consumption (and production) with the development of world population, shows that a disruption occurred at the beginning of the nineties following the collapse of the Former Soviet Union and the resulting economic repercussions. Until then, per capita consumption had been increasing steeply for more than a decade, after which both growth rates and per capita consumption dropped for a couple of years before recovering again at a fast pace. World consumption increased by 2.2 % per year over the 1992-2002 period, reaching 17 mio mt.

**Graph 9.1 World cheese trends, 1980-2004**



With a consistently positive growth over the 1980-2002 period, North America is the region with the highest per capita cheese consumption. Per capita cheese consumption in Oceania has been rather stable over the past two decades though it has increased slightly in the last few years. Asian per capita consumption is still very low despite average annual growth rates of 2.6 % over the 1980-2002 period.

World cheese **production**, driven by consumption, followed the growing demand closely. World cheese consumption and production currently (2000-2002) stand at almost 17 mio mt and is largely concentrated in Europe and North America, which together represent around 80 % of world production and consumption. The EU remains the main cheese producer and consumer, with production and consumption levels reaching 7.2 and 6.8 mio mt respectively in 2000-2002. The EU is followed by the US which produces and consumes around 4.4 mio mt of cheese. Oceania has been increasing its cheese production over the past decades but it still remains below 1 mio mt.

Asia, Latin America and Africa are less important players, together representing less than 20 % of production and consumption.

#### *Outlook 2005-2014*

Cheese consumption and production is expected to continue its growth and could reach around 21 mio mt (OECD) in 2014, up 4.2 mio mt from the 2000-2002 level. This corresponds to an annual growth rate of 1.7 % for the forecast period 2005-2014. OECD therefore expects the growth in world cheese consumption and production to be less pronounced than it was during the past decade (2.2 % see above) and closer to the growth rates of the 1980s. FAPRI does not publish forecasts for world consumption and production, but if the consumption and production figures of all country forecasts are summed up, the conclusion is that

FAPRI is as optimistic as OECD for the world cheese sector. Annual changes are again at about 1.6 % for both consumption and production from 2005-2014. For both institutions, this anticipated growth is largely due to growing demand worldwide.

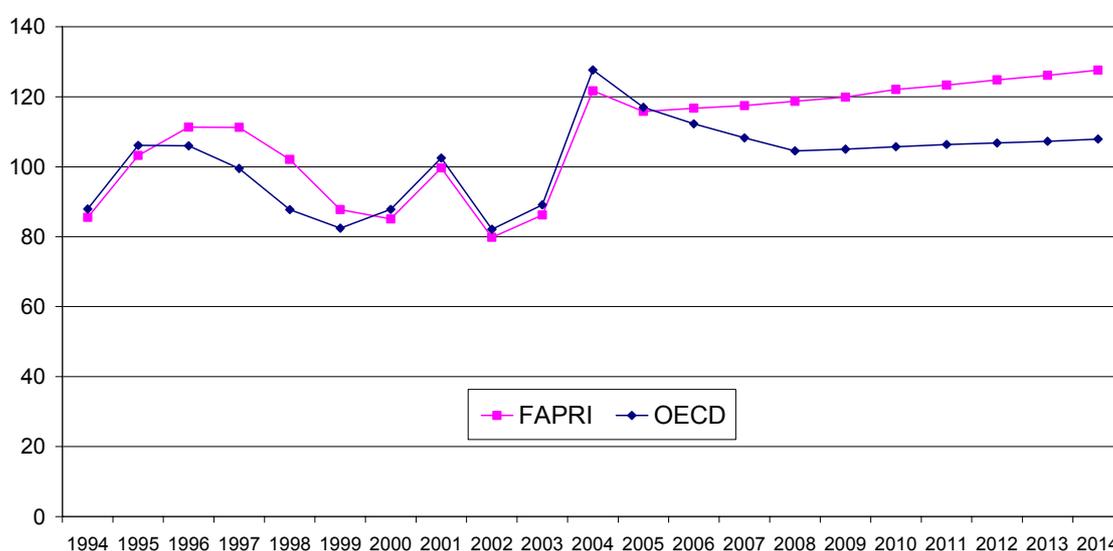
**Table 9.2 Outlook for world cheese markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 70                | 69                 | 45             |
| 1990/92 (FAOSTAT)  | 85                | 86                 | 58             |
| 2000/02            | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | <b>119</b>        | <b>120</b>         |                |
| 2010/12 (FAPRI)    | <b>120</b>        | -                  | <b>153</b>     |

Total exports could increase slightly from 1 mio mt (2000-2002) to 1.4 mio mt in 2014, according to both the OECD and FAPRI, which means that the share of cheese traded would remain below 7 %.

FAPRI expects nominal cheese prices to continue growing after a temporary slow down in 2005, and reach 2.780 \$/t by 2014, higher than the record level of 2004. The OECD projects cheese prices to ease after the 2004 peak and to remain rather stable over the medium term.

**Graph 9.2 World cheese price (1994/1996 =100)**



In spite of the relatively low production, **Oceania** is expected to remain the world's largest cheese exporting region and could increase its share of world market share to around 50 %. **New Zealand** is projected to increase its exports by 50 % over the projection period to 450 000 t (FAPRI) or 400 000 t (OECD) in 2014. **Australian** exports are projected to increase and gain market share. Argentina is projected to

increase its share of the world market, with its cheese exports expected to triple in the medium term.

The two institutions agree that the **EU-25** will reduce its share of the world cheese market from around 40 % in 2004 to 30 % in 2014. This is linked to the decrease in exportable surplus following the projected increase in domestic demand and the limited production capacity linked to the fixed milk quotas.

Japan and Russia are projected to remain the greatest cheese importers, even though their share is set to decrease slightly over the medium term. Both Agencies project a growing import demand from Mexico, which is expected to increase its butter imports substantially over the projection period (+ 65 % for FAPRI and + 40 % for the OECD).

The rest of additional import demand (125 000 t according to FAPRI) is projected to come from the unspecified “rest of the world” aggregate, which includes a multitude of developing countries. While the market share is *assumed* to remain constant over the projection period, it still represents around 30 % of world cheese trade.

## 9.2. Butter

World **butter** per-capita consumption has decreased over the last two decades. While European consumption dropped sharply as a result of lower butter production following the introduction of milk quotas and the negative economic impact of the collapse of the FSU, Asian consumption grew rapidly (however Asian per capita consumption is still very low). The world's largest butter consuming and producing country is India, which has seen outstanding growth rates in both over the last quarter of a century. Butter consumption and production is expected to continue its slow growth in line with growing demand in Asia, with the share of butter traded remaining below 8 %. New Zealand and Australia are expected to remain the world's largest butter exporters and could increase their combined share of the world market to more than 70 %. The EU-25 will reduce its share in the world butter market from around 30 % in 2004 to 20 % in 2014 (even assuming a continuation of export refunds). Russia is projected to remain the greatest butter importer, even though its share is set to decrease slightly from a quarter of world butter trade in 2004 to just below 20 % by 2014.

### *Developments since 1980*

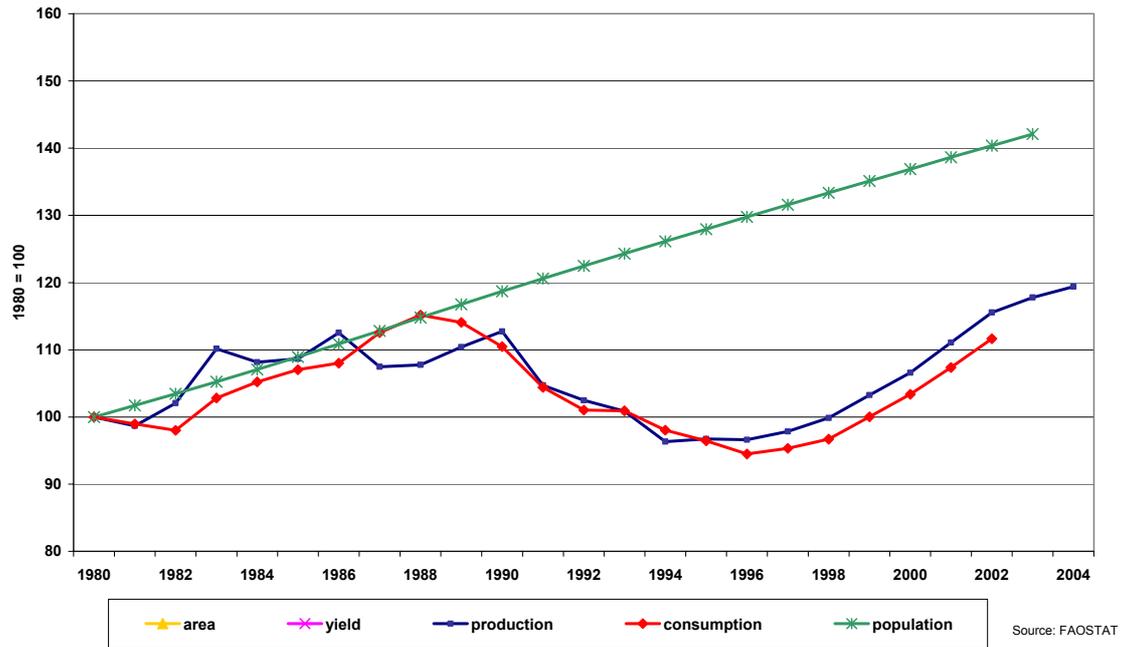
World butter **consumption** grew at an average annual rate of 0.5 % over the 1980-2002 period. This is much lower than the increase in world population, meaning that world per-capita consumption has decreased over the last two decades.

**Table 9.3 Evolution of world butter markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 7                 | 7                  | 0.8            |
| 1990/1992 | 7                 | 7                  | 0.8            |
| 2000/2002 | 8                 | 8                  | 0.8            |

Graph 9.3 which compares indexed (1980 = 100) consumption (and production) with the development of world population shows that a systemic change occurred at the beginning of the 1990s, following the collapse of the Former Soviet Union. Until then, consumption and production had evolved in line with population growth and per capita consumption had been fairly stable for more than a decade. After this turning point however, growth rates dropped and per capita consumption decreased, reaching its lowest point in 1996. World consumption has been recovering since and is back to levels reached in the 1980s, but clearly at much lower per capita consumption levels.

**Graph 9.3 World butter trends, 1980-2004**



While European consumption dropped sharply as a result of lower butter production following the introduction of milk quotas and the negative economic impact of the collapse of the FSU, Asian consumption grew rapidly.

Despite this strong growth however, Asian per capita consumption is still very low; North American per capita consumption is more than double, while Europe's is nearly four times higher. This implies that there is still much growth potential for the butter sector in Asia.

World butter **production**, driven by consumption, followed demand patterns closely. World butter consumption and production currently (2000-2002) stand at almost 8 mio mt. World figures, however, mask two dramatic changes since the early 1990s: regionally, production dropped sharply in Europe, but grew at a very strong pace in Asia (5.5 % per annum on average in 1992-2004) and, though less pronounced, in Latin America.

The sharp drop in butter production in Europe is the combined effect of receding production in the **EU** and the collapse of butter production in the **former Soviet Union** during economic transformation.

Asia's production was mainly driven by **India** and, to a lesser extent China. Indian butter production, which was previously less than a quarter of EU-15 production, is now 40 % greater.

The world's largest butter consuming and producing country is **India**, which has seen outstanding growth rates in both consumption and production over the last quarter of a century.

In 2000-2002, the EU-15 was the second largest butter producer and consumer. The US was ranked third, but at a much lower level.

Butter consumption and production is expected to continue its slow growth and could increase to about 9.7 mio mt (OECD) in 2014/2015, up 2.1 mio mt from the 2000-2002 level. This corresponds to an annual growth rate of 1.7 % for the forecast period 2005-2014. OECD therefore expects world butter consumption and production to grow faster than during the past decade (1.3 % see above) and much faster than in 1980-1992 (0.2 %). FAPRI does not publish forecasts for world consumption and production, but if the consumption and production figures of all country forecasts are combined, it seems FAPRI is as optimistic as OECD for the world butter sector; annual changes are expected to be about 1.6 % for both consumption and production from 2005-2014. Both institutions base their optimism essentially on growing demand in Asia.

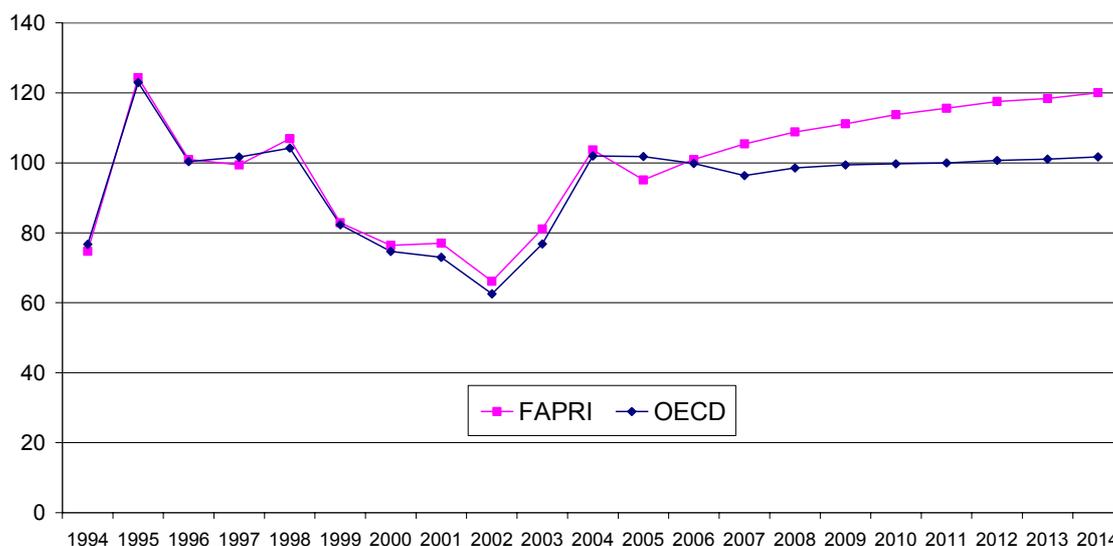
**Table 9.4 Outlook for world butter markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | <b>90</b>         | <b>92</b>          | <b>95</b>      |
| 1990/92 (FAOSTAT)  | <b>96</b>         | <b>98</b>          | <b>91</b>      |
| <b>2000/02</b>     | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | <b>120</b>        | <b>122</b>         |                |
| 2010/12 (FAPRI)    | <b>124</b>        | -                  | <b>126</b>     |

Total exports could increase slightly from 0.6 mio mt (2000-2002) to 0.7 mio mt in 2014/2015, according to OECD, which means that the share of butter traded would remain below 8 %. FAPRI sees a slightly higher increase with net exports reaching 0.8 mio mt.

FAPRI expects nominal butter prices to continue growing after a temporary slow down in 2005, and reach 2080 \$/t by 2014, close to the record level of 1995. The OECD projects butter prices to remain stable at their 2004 levels over the medium term.

**Graph 9.4 World butter price (1994/1996 =100)**



**Oceania** is expected to remain the world’s largest butter exporting region and could increase its share of world market share to more than 70 %. **New Zealand** is projected to increase its exports by 17 % over the projection period to 430 000 t (FAPRI) or even to 480 000 t (OECD) in 2014. FAPRI projects **Australian** exports will increase and gain market share while the OECD sees a slowing down in Australian butter exports and more milk being channelled into other dairy products, notably cheese. After its return to the world market in 2005, **Ukrainian** butter exports are projected to decrease gradually over the medium term, bringing its market share below 8 % by 2014 (FAPRI). **India** will see very high growth rates in both consumption and production, just about self sufficiency levels.

The two institutions agree that the **EU-25** will reduce its share in the world butter market from around 30 % in 2004 to 20 % in 2014. This is linked to the decrease in production provoked by the reduction in the butter support price (– 25 %) following CAP reform.

Russia is projected to remain the greatest butter importer, even though its share is set to decrease slightly from a quarter of world butter trade in 2004 to just below 20 % by 2014 (FAPRI). According to the OECD Russia is expected to increase its imports substantially (+ 75 %) over the projection period. Both agencies project a growing import demand from Mexico, which is expected to increase its butter imports substantially over the projection period (+ 32 % for FAPRI and + 88 % for the OECD).

The rest of additional import demand (+ 17 % according to FAPRI) is projected to come from the unspecified “rest of the world” aggregate, which includes a multitude of developing countries. While the market share is assumed to remain constant over the projection period, it still represents more than 50 % of world butter trade.

### 9.3. SMP

World **skimmed milk powder (SMP)** consumption has been declining since the mid 1980s, as the introduction of milk quotas in the EU (the world's largest producer and consumer of SMP) resulted in lower SMP availability. Use of SMP for calf feed in the EU decreased substantially, from 80 % of total consumption in 1980 to around 40 % in 2002. While FAPRI foresees a gradual increase in SMP production and trade, the OECD expects the recent slow down in production to continue. Oceania is expected to remain the world's largest SMP exporting region and could increase its share of world market share to nearly 50 %. The EU-25 is projected to reduce its share of the world SMP market, from around 25 % in 2004 to 15 % in 2014, in line with lower production due to CAP reform price cuts. South-East Asian countries, notably Indonesia and the Philippines, remain the main destination for SMP. Mexico is the other main SMP importer.

#### *Developments since 1980*

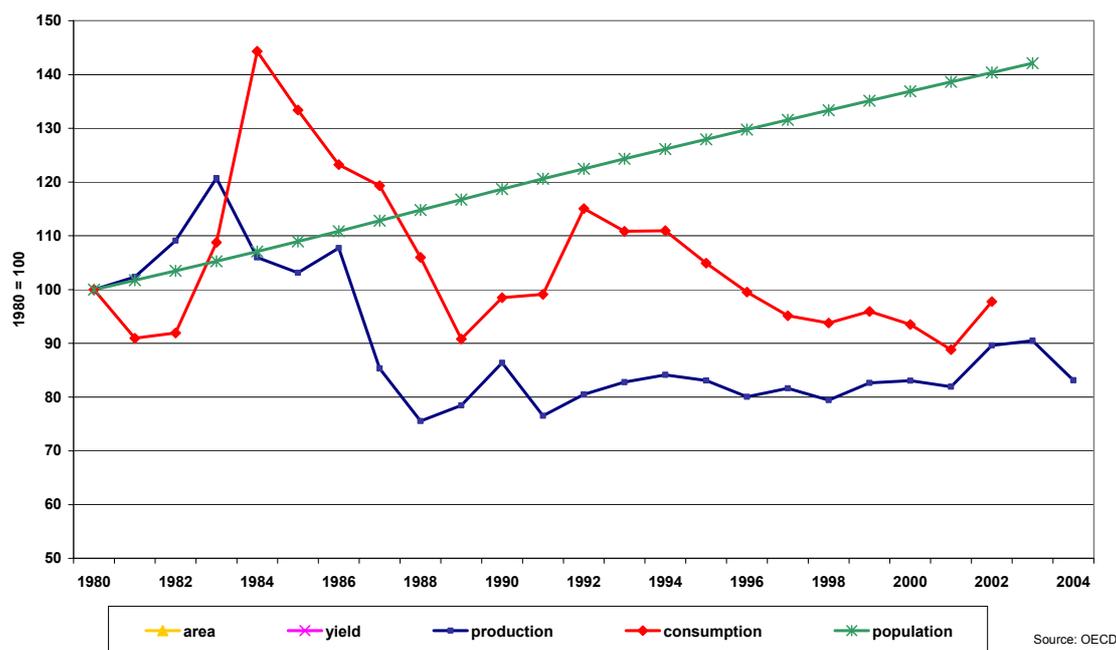
World SMP **consumption** has been declining since the mid 1980s, resulting in an average annual fall of – 0.8 % over the 1980-2002 period.

**Table 9.5 Evolution of world SMP markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 4                 | 3                  | 0.9            |
| 1990/1992 | 3                 | 4                  | 0.9            |
| 2000/2002 | 3                 | 3                  | 1.2            |

If one looks at graph 9.5 which compares indexed (1980 = 100) consumption (and production) with the development of world population, it can be concluded that a systemic change occurred in the mid 1980s. Until then, consumption and production had evolved in line with, or above population growth. After this, growth rates dropped and turned negative. Per capita consumption decreased substantially until the beginning of the 1990s and has stabilised somewhat since.

**Graph 9.5 World SMP growth, 1980-2004**



Regional breakdown of consumption reveals this structural break took place when European consumption dropped sharply due to lower availability following the introduction of milk quotas in 1984. Use of SMP for calf feed in the EU decreased substantially, from 80 % of total consumption in 1980 to around 40 % in 2002.

SMP consumption remains much lower in other parts of the world, although Oceania has increased its per capita consumption over the last decade.

World SMP **production** is driven by consumption and therefore followed the drop in demand closely. World SMP consumption and production currently (2000-2002) stands at almost 3 mio mt. Regionally, production dropped sharply in Europe but grew, albeit at low levels, in North America (4.6 % per annum on average in 1992-2004).

#### *Outlook 2005-2014*

OECD and FAPRI do not agree on SMP production projections. While FAPRI foresees a gradual increase in SMP production (+ 14 % over the projection period, mainly in Oceania and developing countries), the OECD expects the recent slow down in production to continue. OECD expects world SMP consumption to decrease by 0.7 % per year, compared to the slight increase of the previous decade (+ 0.2 % p.a.).

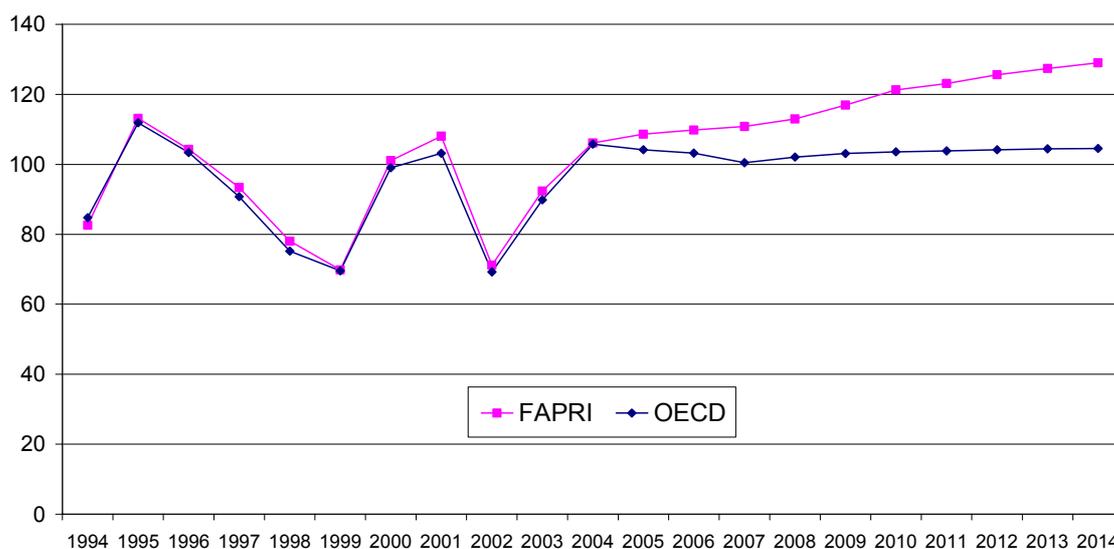
**Table 9.6 Outlook for world SMP markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 122               | 101                | 77             |
| 1990/92 (FAOSTAT)  | 96                | 112                | 77             |
| 2000/02 (FAOSTAT)  | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | 92                | 104                | -              |
| 2010/12 (FAPRI)    | <b>114</b>        | -                  | <b>126</b>     |

Divergence also exists for trade projections as FAPRI projects a moderate growth in world net trade (14 % over the projection period) while the OECD expects world SMP trade to shrink in the short term and recover only partially in the long term (but still remain 11 % lower than in 2004).

FAPRI expects nominal SMP prices to continue growing and reach a record level of 2400 \$/t by 2014. On the other hand the OECD projects SMP prices to remain stable at their 2004 levels in the medium term.

**Graph 9.6 World SMP price (1994/1996 =100)**



**Oceania** is expected to remain the world's largest SMP exporting region and could increase its share of world market share to nearly 50 %. **New Zealand** is projected to increase its exports by 19 % over the projection period to 370 000 t (FAPRI) or even to 485 000 t (OECD) in 2014. FAPRI projects **Australian** exports to increase and gain market share while the OECD sees only a limited increase in absolute terms and a slowing down in its world market share, as more milk proteins are being channelled into other dairy products, notably cheese. The FAPRI sees US exports increasing over the medium term reaching more than 20 % of world market share. The OECD on the other hand expects a decrease in US SMP exports to less than 100 000 t by 2014.

The two institutions agree that the **EU-25** will reduce its share of the world SMP market, from around 25 % in 2004 to 15 % in 2014. This is linked to the decrease in production following CAP reform which brought the SMP support price down by 15 %.

South-East Asian countries, notably Indonesia and the Philippines (which are expected to import 130 000 t and 250 000 t respectively by 2014 according to FAPRI), remain the main destination for SMP. Mexico is the other main SMP importer, with 15 % of world trade.

The rest of import demand is projected to come from the unspecified “rest of the world” aggregate, which includes a multitude of developing countries. While the market share is projected to decrease over the projection period, it still represents nearly 40 % of world SMP trade.

#### 9.4. Whole milk powder

World **whole milk powder (WMP)** consumption has remained stable since the mid 1990s, as the drop in European consumption was compensated by the growth in Asia and Latin America (where WMP is used for reconstituted milk). World WMP production, consumption and trade are projected to grow at a fast pace over the medium term. Oceania is expected to remain the world's largest WMP exporting region and could increase its share of the world market to 75 %. Argentina is also expected to increase its exports over the medium term, and to attain over 25 % of the world market share while the EU-25 will lose part of its share, even assuming an unchanged export refund policy. South-East Asian countries, notably Indonesia, are to become important importers of WMP. 80 % of world WMP imports are in developing countries.

##### *Developments since 1980*

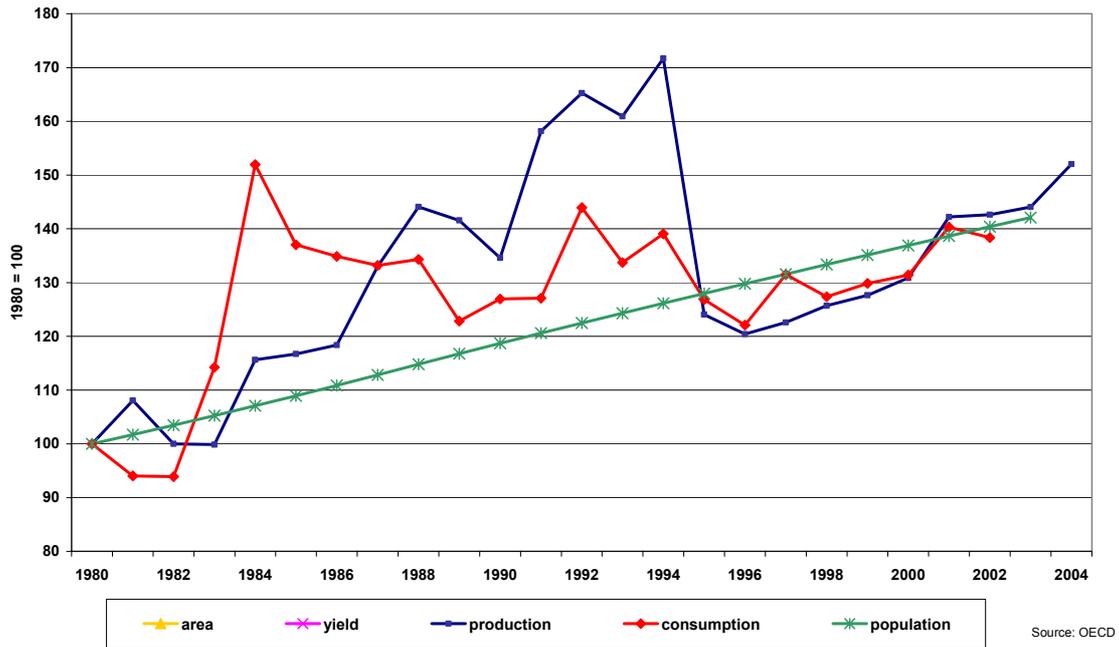
After a rapid increase at the beginning of the 1980s, world WMP **consumption** has remained stable, showing an average annual growth rate of 1.7 % over the 1980-2002 period.

**Table 9.7 Evolution of world WMP markets (mio mt)**

|           | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|-----------|-------------------|--------------------|----------------|
| 1980/1982 | 2                 | 2                  | 0.7            |
| 1990/1992 | 4                 | 3                  | 1.0            |
| 2000/2002 | 3                 | 3                  | 1.6            |

If one looks at graph 9.7 which compares indexed (1980 = 100) consumption (and production) with the development of world population, it can be concluded that a systemic change occurred in the mid 1980s. Until this turning point, consumption evolved in line with, or above population growth. After it, per capita consumption decreased until the mid 1990s and has plateaued over the last decade.

**Graph 9.7 World WMP growth, 1980-2004**



Regional breakdown of consumption reveals the structural break which occurred in middle of the 1980s showing that while European consumption dropped sharply due to lower availability following the introduction of milk quotas in 1984, Asia and Latin America’s consumption (where WMP is used for reconstituted milk) peaked.

WMP consumption remains much lower in other parts of the world, although Africa has increased its per capita consumption over the last decade.

WMP **production** has followed the pattern of demand. World WMP consumption and production currently (2000-2002) stands at almost 3 mio mt. Regionally, production dropped sharply in Europe, but grew in Oceania, Latin America and Asia (7.6 and 4 % per annum respectively in 1992-2004).

*Outlook 2005-2014*

World WMP production and consumption are projected to continue growing according to OECD and FAPRI forecasts. While FAPRI sees room for a dramatic increase in WMP production (+ 34 % over the projection period, mainly in Oceania and developing countries), the OECD shows lower growth rates (+ 25 % over the same period). OECD expects world WMP consumption to increase by 2 % per year.

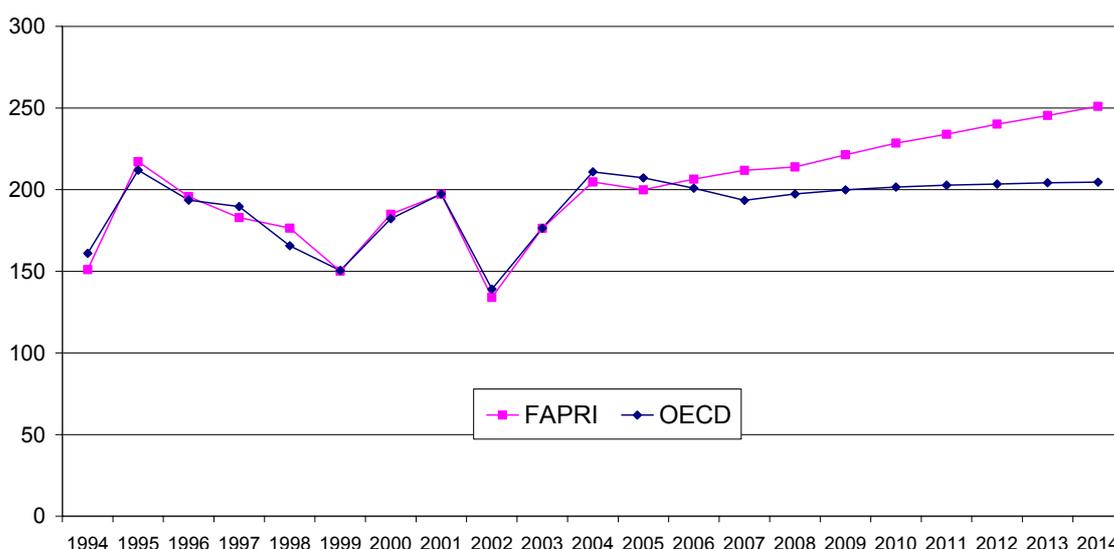
**Table 9.8 Outlook for world WMP markets**

| <i>Index 00/02</i> | <b>Production</b> | <b>Consumption</b> | <b>Exports</b> |
|--------------------|-------------------|--------------------|----------------|
| 1980/82 (FAOSTAT)  | 74                | 70                 | 46             |
| 1990/92 (FAOSTAT)  | 110               | 97                 | 59             |
| 2000/02 (FAOSTAT)  | <b>100</b>        | <b>100</b>         | <b>100</b>     |
| 2010/12 (OECD)     | <b>125</b>        | <b>134</b>         | -              |
| 2010/12 (FAPRI)    | <b>134</b>        | -                  | <b>133</b>     |

FAPRI projects a moderate growth in world net trade (16 % over the projection period) while the OECD expects world WMP trade to increase at faster pace (+ 23 % over the same period).

FAPRI expects nominal WMP prices to continue growing and reach the record level of 2.500 \$/t by 2014. On the other hand, the OECD projects WMP prices to remain stable at their 2004 levels over the medium term.

**Graph 9.8 World WMP price (1994/1996 =100)**



**Oceania** is expected to remain the world’s largest WMP exporting region and could increase its share of world market share to 75 %. **New Zealand** is projected to increase its exports by 12 % over the projection period to 775 000 t (FAPRI) or 750 000 t (OECD) in 2014. FAPRI projects **Australian** exports to increase and gain market share while the OECD sees only a limited increase in absolute terms and a slowing down in its world market share, as more milk proteins are being channelled into other dairy products, notably cheese. FAPRI sees Argentinean exports increasing over the medium term, reaching more 25 % of world market share. The two institutions agree that the **EU-25** will reduce slightly its share of world WMP market.

South-East Asian countries, notably Indonesia, is indicated by FAPRI to become an important importer of WMP. The rest of import demand is projected to come from the unspecified “rest of the world” aggregate, which includes a multitude of developing countries. While the market share is assumed to remain constant over the projection period, it still represents more than 80 % of world WMP trade.

## 10. CONCLUSIONS

Although the prospects for agricultural markets are, inevitably, subject to some uncertainty, certain patterns are clearly emerging. In particular, there has been a noticeable shift in the main producing and exporting countries in recent years which is likely to continue – even accelerate - in the future.

Firstly, and perhaps rather uncomfortably close to home, this report highlights the factual evidence that **the EU** has lost a marked proportion of its market share in almost every sector. This is the result, albeit a rarely acknowledged one, of the ongoing agricultural policy reform process. Quotas have for some time kept production stable in the dairy and sugar sectors, the pork and poultry sectors have become more competitive as a by-product of the cereal reform, and far lower surpluses exist for cereals and beef due to significant restructuring here as well.

This trend is not expected to change in the future. On the contrary, the latest reforms (including decoupling of aids and restructuring of the dairy and sugar sectors) will most likely accelerate the EU's expected withdrawal from bulk commodity markets and support the anticipated increase in its value added exports.

Where **the US** is concerned, the picture is slightly more mixed. While it continues to hold a significant presence in world bulk commodities markets – in particular, continuing to dominate the world maize market – it has lost some of its market share in wheat and soybeans. In meat and cotton, on the other hand, its market share has increased, and significantly so in the case of the latter.

In the rest of the developed world, **Australia** has been increasing its exports in most commodities, **New Zealand** has experienced even more rapid growth but in a more limited range of products (essentially dairy) and Canada has remained relatively stable, though in some products it has slightly increased its export share.

A second important point that this report highlights is the fact that the most dramatic changes in agricultural commodity markets are taking place in the developing world, in particular in its three agricultural giants: Brazil, India and China. **Brazil**, although the “smallest” of the three in terms of its population and GDP, has nevertheless seen the most significant agricultural market developments of the three. The pace of growth in its soybean, beef, pork, poultry, sugar, and even cotton sectors in recent years has been simply staggering. One has to wonder whether it can maintain this pace and if so, what the impact will be on world market prices.

**China**, on the other hand, has seen similarly significant developments, albeit on the other side of the equation; it has increased its imports for almost every commodity in which Brazil has increased its exports. It begs similar questions: Can this continue indefinitely and what are the implications for world market prices if it cannot?

Of the three, **India** remains the great unknown. It is a major producer and consumer of agri-food products, and overall a net exporter of these products, despite of a marked decline in its net trade in recent years. Changes in the domestic situation have a rapid impact on trade especially growth in its GDP has been so strong that the additional wealth it has generated has translated into food demand that is increasingly difficult to

satisfy on its internal market alone. How India develops in the coming years adds an element of uncertainty to the future of world agricultural markets, simply because of its size. It is very much a space that agricultural policy analysts will certainly be watching very closely.

Another element of ambiguity at this stage is how the development of **biofuel** sector will impact on world agricultural markets, in particular on cereals, oilseeds and sugar crops. The direction of change is clear: there is a growing demand for biofuel, fostered by environmental concerns, economic factors, strategic issues and evolving policy, but the magnitude of change, and its repercussions for the agricultural sector, requires further analysis. Moreover, there are elements of uncertainty. In particular, at the time of going to press, it is unclear how policy measures may change in the coming years, particularly given the question marks hanging over the economic and environmental balance and the trade-off between food and non-food uses.

The strongest growth in overall biofuel production is expected in Brazil, the US and the EU, but there are also good prospects in Asia (especially South East Asia, India and China) and in other countries of the American continent (Canada, Central America). Trade is projected to develop from South to North America. EU imports are set to increase following the implementation of the biofuel legislation. Asian needs are likely to be covered by regional exporters (including Australia) but also by Latin America. Palm oil exports from Malaysia and Indonesia will continue to soar and fuel uses of other oil crops are expected to develop in Asia. Some countries in Southern Africa could also export ethanol to both the Far East and the EU.

The growth in biofuel uses will also contribute to enhanced demand for **maize** and **oilseeds**. These commodities already benefit from sustained demand for feed and/or food uses and this is expected to continue under the outlook projections. In the case of oilseeds, the competition between food and fuel uses will become more marked for oil, oilmeals being a co-product in both cases. In the case of maize, it is more a trade off between feed and other non-food uses which means a link has to be made to the outlook for the livestock sector as well. This link is also relevant to trade analysis because a decline in the export of grains or meals can in turn translate into higher exports of meat. One final point concerning the **meat sector** is the fact that the outlook – as established in 2005 – is rather optimistic. Although the beef sector is expected to grow faster than it has in past decades, the growth rate in the pig meat and poultry sectors is expected to slow down and recent history shows unexpected animal health epidemics can have serious, unpredictable and lasting repercussions on agricultural markets, particularly the sector it directly affects. In particular, the spread of avian influenza has the potential to cause the first major disruption for the world poultry sector, with significant negative knock-on effects for the feed cereals and oilseed/meals markets.

## 11. ANNEX

|   |
|---|
| <p style="text-align: center;"><b>Agricultural Commodity Markets</b><br/><b>Past developments and outlook</b><br/><b>Methodology used for the statistical data extraction</b></p> |
|---|

### Introduction:

The aim of this work (dataset and publication) is to give a good overall picture on the evolution of the main agricultural commodities during the last two decades using data from FAO, FAPRI, USDA and OECD. Trade data included also contains forecasts according to scenarios developed by USDA, FAPRI and OECD.

The data set includes statistics on the following commodities:

#### CEREALS:

- Cereals, excluding Rice
- Cereals
- Coarse grains
- Barley
- Corn
- Rice (Paddy rice)
- Wheat

- Pork
- Poultry
- Sheep

#### ANIMAL PRODUCTS:

- Butter
- Cheese
- Skimmed Milk Powder (SMP)
- Whole Milk Powder (WMP)

#### OILSEEDS:

- Oilcrops aggregated
- Palm oil
- Rapeseed
  - Rapeseed cake
  - Rapeseed oil
- Soybeans
  - Soybeanseed cake
  - Soybeanseed oil
- Sunflowerseed
  - Sunflowerseed cake
  - Sunflowerseed oil

#### Main regions and countries covered are:

- Europe
- Africa
- Asia
- North America
- Latin America & Caribbean
- Oceania
- Argentina
- Australia
- Brazil
- Canada
- China
- European Union (15)
- FSU (USSR)
- India
- Indonesia
- Japan
- Mexico
- New Zealand
- Russian Federation
- South Africa (Rep. of)
- Thailand
- Ukraine
- United States of America (USA)

#### SUGAR:

- Sugar
  - Sugar beet
  - Sugar cane

#### COTTON:

- Cotton
- Cotton Lint

#### LIVESTOCK:

- Meat (aggregate)
- Beef

Preference was given to FAOSTAT (<http://faostat.fao.org/>) as the main data source and data extraction reflects the situation between mid-July and mid-September 2005. "Production", "Harvested Area" and "Yield" were mostly extracted from the datasets on "Agricultural Production" (most recent data generally up to 2004) and the "Consumption" was aggregated from data series contained in the "Commodity balances" (most recent data generally up to 2002). Population data, used for demographic trends and average per capita consumption, was extracted from the 'Population' data series.

Ending stocks have been collected from the USDA/PS&D database ([http://www.fas.usda.gov/psd/complete\\_files/default.asp](http://www.fas.usda.gov/psd/complete_files/default.asp)); whereas "Prices" and "Trade" data, including forecasts, have been mostly inserted from FAPRI Outlook (<http://www.fapri.iastate.edu/>).

Additionally, data from the OECD Outlook 2005 (<http://www.oecd.org/>) has been used to complete some collections.

### **Summary tables included in the report**

For each commodity, the report identifies the key changes that emerged over the last 25 years and comments on projections for the medium term. For this purpose, two standard tables are included in each commodity chapter.

The first one, entitled "Evolution of world markets" summarises developments in production, consumption and trade since 1980. It indicates three-year averages in mio mt for each decade, based on data provided by FAO. The totals for world exports exclude EU intra trade, but as figures for EU intra trade are only available from 1986 onwards, data for the years 1980/1982 is based on the assumption that the share of EU Intra trade is the same as in the period from 1986 to 1988.

The second table summarises the "Outlook for world markets", again for production, consumption and exports shown as indexed, based on the average for 2000/2002 (i.e. 2000/2002=100). This allows developments to be analysed decade by decade and forecasts to be compared (as it is also a way to deal with statistical differences). The first two lines of the table, relating to 1980/1982 and 1990/1992, recall averages for the last two decades, using FAO data. As 2000/02 is the reference year for the index, it always shows the value 100. The following lines of the table list indexes for the outlook by 2010/2012 using input (both for 2000/2002 and for the 2010/2012) from FAPRI, the FAO-OECD and, in some specific cases, USDA.

## Layout of the datasets

By commodity or aggregate a set of comparable analysis have been prepared, including:

### **Tables:**

1. A “Summary sheet” providing, where available or applicable, information concerning area or slaughtering, yield, production and consumption. This table is organised by country/region and shows the most recent available value, a recent 3 year average, as well as a trend for the period 1992-2004.

2. A table with “Annual Growth Rates in Percentage”, providing information concerning area or slaughtering, yield, production and consumption. This table is organised by country/region and lists trends for the periods 1980-1992, 1992-2004 and 1980-2004. The growth rates have been calculated using the formula:

$$100*\exp[\ln(t+n/t)/n]-100$$

where t+n stands for the last available value in the given period

t stands for the first available value in the given period

n stands for the number of periods (number of years-1) covered

3. A table listing the “Data availability”, providing for any value listed in the first two tables, but also for the graphs, the periods when data is available by the used data source for that specific commodity.

### **Graphs:**

4. “ImpExp” is a graph showing the evolution of the net trade for the three year averages 1980/1982, 1990/1992 and 2000/2002, as well as, when available, forecasted projections from FAPRI, OECD and USDA for a three year average 2010/2012

4A ImpExpVal uses data from FAOSTAT to show the evolution of trade for the same net importer & net exporter as in graph 4 but expressed in value terms (1000 \$). Efforts have been made to “align” the different sources, for the graphs 4&4A, meaning that the same product or product-aggregate has been used or -if not available- the closest match (i.e. Rice versus Rice, Paddy).

5. “World Trade” shows the total exports, as well as a breakdown by main exporters.

6. Graph A1: “World Total, Area/Slaughtering and Yield” shows a time series from 1980-2004, with the total area harvested for that commodity, as well as the world average yield.

7. Graph A2: “World Total, Production and Consumption” shows a time series from 1980-2004, with the evolution of production and consumption.

8. Graph A3: “World Total, Growth/Trend” is a calculated index based on the 1980-value, showing the trend for area, yield, production, consumption and population.

9. Graph A4: “World, Stocks and Prices” shows two time series with “Ending stocks” (i.e. stocks at the end of the period) and “Prices”

10. Graph A5: “Area/Slaughtering, by main regions” shows developments over time by region.

11. Graph A6: “Area/Slaughtering, by main (cereal) producer” shows developments over time for a number of selected countries.

12. Graph A6B: “Area/Slaughtering, by main producers amongst observed countries” complements Graph A6, but filters the five most important countries out of the observed countries (see introduction for list of observed countries)

13. Graph A7: “Yield, by main regions” shows yield developments by main region.

14. Graph A8: “Yield, by main (cereal) producer” shows how the average yield developed for a number of selected countries over time.

15. Graph A8B: “Yield, by main producers amongst observed countries” complements Graph A8, but filters the five most important countries out of the observed countries (see introduction for list of observed countries)

16. Graph A9: “Production, by main regions” shows how the total production developed by main region over time.

17. Graph A10: “Production, by main (cereal) producer” shows how the total production developed for a number of selected countries over time.

18. Graph A10B: “Production, by main producers amongst observed countries” complements Graph A10, but filters the five most important countries out of the observed countries (see introduction for list of observed countries)

18a. Graph A10C: “Production, by main producers” complements Graph A10, shows production developments for some commodities, in the five (sometimes more) most important producing countries worldwide.

19. Graph A11: “Consumption, by main regions” shows how the total consumption developed by main region. FAO aggregates “Asia” and “Europe” include the countries from the Former Soviet Union since 1992; this means the total consumption of some commodities saw an atypical evolution between 1991 and 1992 for these two regional aggregates; if this happened additional text was inserted on the graph.

20. Graph A12: “Consumption, by main (cereal) producers” shows how the total consumption developed for a number of selected countries over time.

20a. Graph A12C: “Consumption, by main consumers” complements Graph A12, shows consumption developments, for some commodities, in the five (sometimes more) most important consuming countries worldwide.

21. Graph A13: “Per capita consumption, by main region” shows the per capita consumption by main region. As this does not apply to all commodities (i.e. oilseeds) this graph is not shown for all.

22. Graph A14: “Per capita consumption, by main (cereal) producers” shows the per capita consumption by main region. As this does not apply to all commodities (i.e. oilseeds) this graph is not shown for all.

### ***Data tables:***

23. The worksheet, “Data,” contains all data series that have been used to load the different tables and graphs, except those on trade (“ImpExp” and “World Trade”).

24. The worksheet, “Trade Data,” contains all data series that have been used to produce the graphs “ImpExp” and “World Trade”.

### **Annotations relating to the geographical definitions**

Given the time period that this report covers, attention should be drawn to two major political events which have had repercussions on agricultural commodity markets. The most important, as regards its impact on the current statistics, has been the dissolution of the Former Soviet Union (FSU / USSR). Given that some of the countries resulting from the split of the FSU are located in Europe<sup>4</sup>, whereas others are in Asia<sup>5</sup>, this has had the following implications:

- USSR data series end in 1991<sup>6</sup>;
- Russian Federation and Ukraine data series start as of 1992;
- “Europe” and “Asia” FAO data series’ aggregates start in the data collection on “Agricultural Production” as of 1992. On the other hand in the data collection ‘Commodity Balances’ data is available for the whole period, but merges with the new data (resulting in some atypical trend lines between 1991 and 1992)
- “Europe (Former)” and “Asia (Former)” FAO data series’ aggregates are available for the whole period in the data collection on “Agricultural Production”, but do not include the countries from the FSU. The same aggregates are not available in the data collection “Commodity balances”, used for consumption data.

The European Union has also seen some change in size due to different enlargements<sup>7</sup>. For the current publication the FAO aggregate “EU-15” has been used, but attention should be drawn to the fact that this aggregate covers all EU-15 countries since 1980, regardless of when they joined the EU. (The same applies to the EU-25 aggregate, but this hasn’t been used in this presentation). The aggregate EU-15 and EU-25 as shown by USDA/PS&D have also raised some concerns, both as regards the aggregated figures shown, as well as the period that they cover.

The “North America” aggregate used in this series is not based on an existing FAO aggregate. It brings together data from the USA and Canada.

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<sup>4</sup> Belarus, Estonia, Latvia, Lithuania, Republic of Moldova, Russian Federation, Ukraine

<sup>5</sup> Armenia, Republic of Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan

<sup>6</sup> FAOSTAT publishes additionally an aggregate called “USSR, Former Area of” going beyond 1991, but this has not been used as the countries are covered in other aggregates

<sup>7</sup> 1981 : Greece ; 1986 : Portugal and Spain ; 1995 : Austria, Finland and Sweden; (2004: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia)

“Europe”, “Africa”, “Asia”, “Latin America & Caribbean” and “Oceania” are determined using the existing FAO aggregates.

### **Annotations relating to variables**

For production, area/slaughtering, ending stocks, prices and trade data, the variables have been used as provided by the data sources, but may have been weighted.

For yield the data has been used, when available, directly from the data sources. In some limited cases yield was calculated, where it was not otherwise available. This was done using the following formula:

$$[\text{Production}] / [“\text{Harvested area}” \text{ or } “\text{Slaughtering}”]$$

For consumption, and when FAO data was used, the values shown are the sum of “Feed”, “Seed”, “Waste”, “Food manufacture”, “Food” and “Other uses”. At the moment of extraction the ‘Commodity Balances’ data series provided data up to 2002.

### **Annotations relating to commodities**

#### **CEREALS:**

##### Aggregates:

The data collection on cereals encompasses different commodities (barley, corn, rice, wheat) as well as an aggregate (“Total cereals excluding rice”) which is the difference of the published FAO aggregate “Cereals, Total” and “Rice, Paddy”.

“Coarse grains”, elaborated alongside the “Cereals” aggregate, uses the FAO definition “Coarse Grain, Total” (which is listed in the annex) and excludes Paddy Rice and Wheat.

##### Barley:

-/-

##### Corn:

-/-

### Rice, Paddy<sup>8</sup>:

The rice dataset has been extended for the producers and consumers, not only to produce a graph for the observed countries, but also to provide two graphs showing the main producers and consumers overall. Whereas figures for historic production and consumption refer to paddy rice, the figures for trade and projections are expressed in milled equivalent.

### Wheat:

-/-

## **OILSEEDS:**

### Aggregate:

#### **Oilcrops aggregated**

This aggregate has been compiled specifically for the purpose of the report. It is derived from the FAO aggregate “Oil crops, Primary”, but does not include all the commodities; neither does it apply a weighting factor.

#### **Vegetable oils**

This aggregate is based on the FAO aggregate 2914 “Vegetable oils”, available in the “Commodity Balances”. Thus not only consumption, but also production data comes from that dataset, and area and yield are not available.

### Palm oil

Palm oil uses the FAO definition in ‘Commodity Balances’. Malaysia, as one of the major producers, is listed additionally in the three first tables.

### Rapeseed, Soybeans, Sunflowerseed

**Rapeseed, Soybeans and Sunflowerseeds** have each been analyzed in three different sets, the first one giving information on agricultural production, and the two additional sets listing details about the Oil and Cake/Meal, using data from the ‘Commodity Balances’.

‘Rapeseed’ with additional analysis on ‘Rapeseed cake’ and ‘Rapeseed oil’.

‘Soybeans’ with additional analysis on ‘Soybeanseed cake’ and ‘Soybeanseed oil’.

‘Sunflowerseed’ with additional analysis on ‘Sunflowerseed cake’ and ‘Sunflowerseed oil’.

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<sup>8</sup> Definition extracted from FAOSTAT site : “RICE PADDY (Oryza spp., mainly oryza sativa): Rice grain after threshing and winnowing. Also known as rice in the husk and rough rice. Used mainly for human food.”

## **SUGAR:**

Sugar has been analyzed in three different sets, the first one listing data from the FAO 'Commodity Balances' data sets, and providing overall information on Production and Consumption.

The two additional sets are using data from the 'Agricultural Production' data sets and list information on sugar beets and sugar cane.

Trade data is only provided for sugar. EU trade data for the year 1993/1994 has been taken from the FAPRI 2004 data tables. Indonesia has been added as an extra country in the "Trade" graphs.

## **COTTON:**

### Cotton

The cotton dataset has been extended for the producers and consumers, not only to provide a graph for the observed countries, but also to include two graphs showing the main producers and consumers overall.

### Cotton Lint

An extra series on cotton lint, showing production and consumption data as used in the "FAOSTAT Balance sheet" tables, has been added to show the trends of Cotton lint

## **LIFESTOCK:**

### Meat (aggregate)

-/-

### Beef

-/-

### Pork

In the graph on 'World Trade' 'Total exports' are less than 'Total Net exports'. This is under investigation.

### Poultry

-/-

### Sheep

Data on sheep "Slaughtering" and "Yield" is based on the data set 'Agricultural Production' using the 'Mutton and Lamb' commodity. Both production and consumption are based on the data set 'Commodity Balance', using the 'Mutton and Goat' commodity.

Stocks have been extracted from FAOSTAT for 'Sheep' and prices from OECD.

## **ANIMAL PRODUCTS:**

### Butter

Both production and consumption have been extracted from FAOSTAT 'Commodity Balance' dataset, using the 'Butter and Ghee' aggregate.

### Cheese

'Ending stocks' for the world are a result of summing the national figures in PS&D for cheese. They show a major decrease by 1997. This seems to result from the fact that the PS&D aggregate for EU-15 (which was introduced to replace the EU-15 member states) is far smaller than the ending stocks by the individual countries in 1996.

### Skimmed Milk Powder (SMP)

Most data has been used from the OECD database, unlike most other series. Production and consumption time series have been adjusted to correctly include EU-15/EU-25.

Whereas PSD has been used, it refers to "Dairy, Milk, Nonfat Dry".

### Whole Milk Powder (WMP)

Most data comes from the OECD database, unlike most other series. Production and consumption time series have been adjusted to correctly include EU-15/EU-25.

Whereas PSD has been used, it refers to "Dairy, Dry Whole Milk Powder".

## Data sources

|                           | Tables |       |       | Trade                |              | World indicators |       |       |              | Area |    |     | Yield |    |     | Production |      |      | Consumption |      |      |      |
|---------------------------|--------|-------|-------|----------------------|--------------|------------------|-------|-------|--------------|------|----|-----|-------|----|-----|------------|------|------|-------------|------|------|------|
|                           | 1      | 2     | 3     | Imp                  | World        | A1               | A2    | A3    | A4           | A5   | A6 | A6B | A7    | A8 | A8B | A9         | A10  | A10B | A11         | A12  | A13  | A14  |
| <b>CEREALS:</b>           |        |       |       |                      |              |                  |       |       |              |      |    |     |       |    |     |            |      |      |             |      |      |      |
| Cereals, excluding Rice   | AP CB  | AP CB | AP CB | PSD                  | PSD          | AP               | AP CB | AP CB |              | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| Cereals                   | AP CB  | AP CB | AP CB |                      |              | AP               | AP CB | AP CB |              | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| Coarse grains             | AP     | AP    | AP    |                      |              | AP               | AP    | AP    |              | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   |             |      |      |      |
| Barley                    | AP CB  | AP CB | AP CB | FAPRI<br>PSD         | FAPRI<br>PSD | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| Corn                      | AP CB  | AP CB | AP CB | FAPRI<br>PSD         | FAPRI<br>PSD | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| Rice (Paddy rice)         | AP CB  | AP CB | AP CB | FAPRI<br>PSD         | FAPRI<br>PSD | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| Wheat                     | AP CB  | AP CB | AP CB | FAPRI<br>PSD<br>OECD | FAPRI<br>PSD | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| <b>OILSEEDS:</b>          |        |       |       |                      |              |                  |       |       |              |      |    |     |       |    |     |            |      |      |             |      |      |      |
| Oilcrops aggregated       | AP CB  | AP CB | AP CB |                      |              | AP               | AP CB | AP CB |              | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   |      |      |
| Palm oil                  | CB     | CB    | CB    | PSD                  | PSD          |                  | CB    | CB    | FAPRI<br>PSD |      |    |     |       |    |     | CB         | CB   | CB   | CB          | CB   |      |      |
| Rapeseed                  | AP CB  | AP CB | AP CB | PSD                  | PSD          | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   |      |      |
| Rapeseed cake             | CB     | CB    | CB    | PSD                  | PSD          |                  | CB    | CB    | FAPRI<br>PSD |      |    |     |       |    |     | CB         | CB   | CB   | CB          | CB   |      |      |
| Rapeseed oil              | CB     | CB    | CB    | PSD                  | PSD          |                  | CB    | CB    | FAPRI<br>PSD |      |    |     |       |    |     | CB         | CB   | CB   | CB          | CB   |      |      |
| Soybeans                  | AP CB  | AP CB | AP CB | FAPRI<br>PSD         | FAPRI<br>PSD | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| Soybeanseed cake          | CB     | CB    | CB    | FAPRI<br>PSD<br>OECD | PSD          |                  | CB    | CB    | FAPRI<br>PSD |      |    |     |       |    |     | CB         | CB   | CB   | CB          | CB   |      |      |
| Soybeanseed oil           | CB     | CB    | CB    | FAPRI<br>PSD<br>OECD | FAPRI<br>PSD |                  | CB    | CB    | FAPRI<br>PSD |      |    |     |       |    |     | CB         | CB   | CB   | CB          | CB   |      |      |
| Sunflowerseed             | AP CB  | AP CB | AP CB | PSD                  | PSD          | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   |      |      |
| Sunflowerseed cake        | CB     | CB    | CB    | PSD                  | PSD          |                  | CB    | CB    | FAPRI<br>PSD |      |    |     |       |    |     | CB         | CB   | CB   | CB          | CB   |      |      |
| Sunflowerseed oil         | CB     | CB    | CB    | PSD                  | PSD          |                  | CB    | CB    | FAPRI<br>PSD |      |    |     |       |    |     | CB         | CB   | CB   | CB          | CB   | CB   | CB   |
| <b>SUGAR:</b>             |        |       |       |                      |              |                  |       |       |              |      |    |     |       |    |     |            |      |      |             |      |      |      |
| Sugar                     | CB     | CB    | CB    | FAPRI<br>OECD        | FAPRI<br>PSD |                  | CB    | CB    | FAPRI<br>PSD |      |    |     |       |    |     | CB         | CB   | CB   | CB          | CB   | CB   | CB   |
| Sugar beet                | AP CB  | AP CB | AP CB |                      |              | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| Sugar cane                | AP CB  | AP CB | AP CB |                      |              | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| <b>COTTON:</b>            |        |       |       |                      |              |                  |       |       |              |      |    |     |       |    |     |            |      |      |             |      |      |      |
| Cotton                    | AP CB  | AP CB | AP CB | FAPRI<br>PSD         | FAPRI<br>PSD | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| <b>LIFESTOCK:</b>         |        |       |       |                      |              |                  |       |       |              |      |    |     |       |    |     |            |      |      |             |      |      |      |
| Beef                      | AP CB  | AP CB | AP CB | FAPRI<br>PSD<br>OECD |              | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| Pork                      | AP CB  | AP CB | AP CB | FAPRI<br>PSD<br>OECD | FAPRI<br>PSD | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| Poultry                   | AP CB  | AP CB | AP CB | FAPRI<br>PSD<br>OECD | FAPRI<br>PSD | AP               | AP CB | AP CB | FAPRI<br>PSD | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| Sheep                     | AP CB  | AP CB | AP CB |                      |              | AP               | AP CB | AP CB | AP<br>OECD   | AP   | AP | AP  | AP    | AP | AP  | AP         | AP   | AP   | CB          | CB   | CB   | CB   |
| <b>ANIMAL PRODUCTS:</b>   |        |       |       |                      |              |                  |       |       |              |      |    |     |       |    |     |            |      |      |             |      |      |      |
| Butter                    | CB     | CB    | CB    | FAPRI<br>OECD        | FAPRI<br>PSD |                  | CB    | CB    | FAPRI<br>PSD |      |    |     |       |    |     | CB         | CB   | CB   | CB          | CB   | CB   | CB   |
| Cheese                    | CB     | CB    | CB    | FAPRI<br>OECD        | FAPRI<br>PSD |                  | CB    | CB    | FAPRI<br>PSD |      |    |     |       |    |     | CB         | CB   | CB   | CB          | CB   | CB   | CB   |
| Skimmed Milk Powder (SMP) | OECD   | OECD  | OECD  | FAPRI<br>OECD        | FAPRI<br>PSD |                  | OECD  | OECD  | FAPRI<br>PSD |      |    |     |       |    |     | OECD       | OECD | OECD | OECD        | OECD | OECD | OECD |
| Whole Milk Powder (WMP)   | OECD   | OECD  | OECD  | FAPRI<br>PSD         |              |                  | OECD  | OECD  | FAPRI<br>PSD |      |    |     |       |    |     | OECD       | OECD | OECD | OECD        | OECD | OECD | OECD |

### Legend:

**AP** = FAOSTAT, Agricultural Production, extracts July-September 2005

**CB** = FAOSTAT, Commodity Balance, extracts July-September 2005

**FAPRI** = FAPRI Agricultural Outlook, March 2005

**PSD** = USDA, PS&D database (Production, Supply & Distribution), Dataset August 2005

**OECD** = OECD Agricultural Outlook, 2005