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Main projections – outlook in brief

- Lower world cereal prices are projected over the Outlook following 5-year highs in 2002. Although prices are expected to remain well above the low levels observed in the years immediately prior to 2002 due to low stock levels, they are not projected to strengthen significantly over the period as faster growth in global production than consumption allows for a gradual rebuild of wheat and coarse grain stocks. In real terms, world wheat and maize prices are expected to remain largely unchanged after 2003.
- Large stocks of rice, particularly in China, have kept international rice prices at relatively low levels even though demand has exceeded supply for several years in a row. As global production catches up to consumption only after 2006, rice prices rise more strongly in the medium term compared to prices of other grains. In real terms, rice prices are projected to rise by almost 4% per year over the projection period.
- After the recent area and yield reductions due to drought and economic upheavals in some countries, world grain production is expected to continue its long-term growth. Compared to 2002, global wheat and coarse grain production will each increase by 15% by 2008. Output growth will be significantly stronger within the OECD than in non-member Economies, in effect catching up from the recent lows. As in the past, most of the additional grain output is expected from increased yields as area expansion is limited. Global rice production should grow by 13% over the period to 2008, with most of it occurring after 2005. Little growth in rice production is projected within the OECD.
- World consumption of wheat and coarse grains expand by 11% and 10%, respectively, between 2002 and 2008, while rice use increases by 7%. Despite lower production over several years and rising prices, rice consumption growth continues largely unchanged, leading to some draw down in initially large stocks. The majority of additional demand for wheat, coarse grains and rice over the Outlook, representing 78%, 67% and 99% respectively, is projected to come from non-member Economies.
- Global wheat and coarse grains stocks are expected to increase by 7% and 9% and to reach 231 and 153 million tonnes, respectively, by 2008. Rice stocks are projected to decline a further 17%, bottoming-out by 2007.

* All crop data are provided on a marketing year basis.

World market trends and prospects

Current market prices unusually high...

Current wheat and coarse grain markets are significantly influenced by extraordinarily low harvests in a number of major producing areas. Droughts in North America and Australia, together with the economic disturbances in Latin America, have resulted in the fifth year in a row of declining global wheat crops (see Box 2). Coarse grain production also significantly declined from the preceding year. At the same time, with consumption hardly being reduced, global stocks have been reduced by another 29 and 33 million tonnes, respectively, with coarse grain stocks at their lowest level since 1983. Consequently, international wheat and coarse grain prices increased significantly, with quotations for the standard US Hard Red Winter wheat peaking at more than 197 USD/t in October 2002 (IGC). Even though prices have since declined significantly, average wheat and maize prices for the crop year 2002 are estimated to be much higher than those in 2001. With increased grain exports from the Black Sea region, Europe faced prices well below those given by the US trade in 2002. The high US prices are not expected to be maintained over the projection period, but they should, nevertheless, be well above the levels observed in the years immediately prior to 2002. At the same time, it is assumed that the gap between US and Black Sea prices will not be maintained over the projection period.

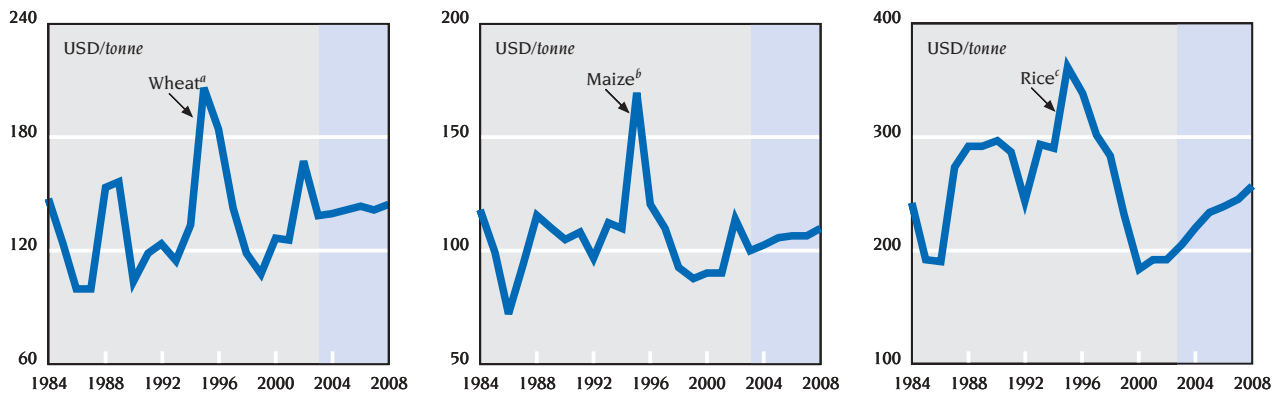
... but long-term trends not substantially changed

Except for the lower stocks, however, the fundamentals in world grain markets have not significantly changed. Consistent with the usual assumption of normal weather, crop productivity is likely to increase throughout the period at a relatively strong pace. At the same time, food consumption of cereals increases only moderately due to a declining rate of population growth and, with increasing incomes, some shift of preferences away from staple cereals to higher value added cereal products. Prices for wheat and coarse grains in 2003 and beyond are therefore expected to be significantly lower than in 2002, though still well above their 2001 levels. The return of prices to more moderate levels is enforced by strong supply response to current high prices. With global production growing faster than consumption, world cereal prices are expected to rise only moderately from 2003 to 2008. Neither wheat nor maize prices are expected to reach their 2002 levels again within the projection period (see Figure 5).

Feed use in developing countries drives markets

The main growth driver for cereal demand continues to be feed use by the livestock industry, which is expected to grow particularly rapidly in the developing world. With non-ruminant meat production in China, Latin America and other parts of the world quickly expanding, feed use of wheat and particularly coarse grains in non-member Economies keeps rising. Coarse grain use for feed in the NMEs is projected to increase by 20% by 2008, compared to 2002. Feed use of wheat in these countries is projected to grow less rapidly at 14%, based on a significantly smaller quantity. These numbers compare to growth in food consumption of cereals which is hardly above population growth rates outside the OECD. Still almost two-thirds of global wheat consumption continues to disappear as direct food use in non-member Economies.

Figure 5. **World grain prices slowly rise after 2003**



a) No. 2 hard red winter, ordinary protein, wheat, USA, f.o.b. Gulf Ports.

b) No. 2 yellow corn, USA, f.o.b., Gulf Ports.

c) Milled, grade b rice, f.o.b. Thailand.

Source: OECD Secretariat.

World wheat and coarse grains stocks to recover

Together with increased global production, world stocks of wheat and coarse grains are projected to recover from their current lows and to increase by 7% and 9%, respectively. Most of the new stocks would be held in North America and, to a lesser extent, Australia, where they were significantly affected by the recent low harvests. Wheat and coarse grain stocks in China, on the other hand, are projected to decline over the outlook period, even though at lower rates than those observed in the recent past. Excess supplies lead to additional stocks in Brazil and Russia.

Rice markets marked by large stocks

Despite global rice production being significantly lower than consumption in 2002, international market prices have not shown any significant increases yet. Thai rice prices have shown some increases in early 2003, but clear trends have been missing. As production is projected to fall short of consumption until 2006, however, world rice prices are expected to rise more significantly than those for other grains, with an increase of 34% projected between 2002 and 2008, in nominal terms. Even in real terms, rice prices are expected to increase considerably (see Figure 6).

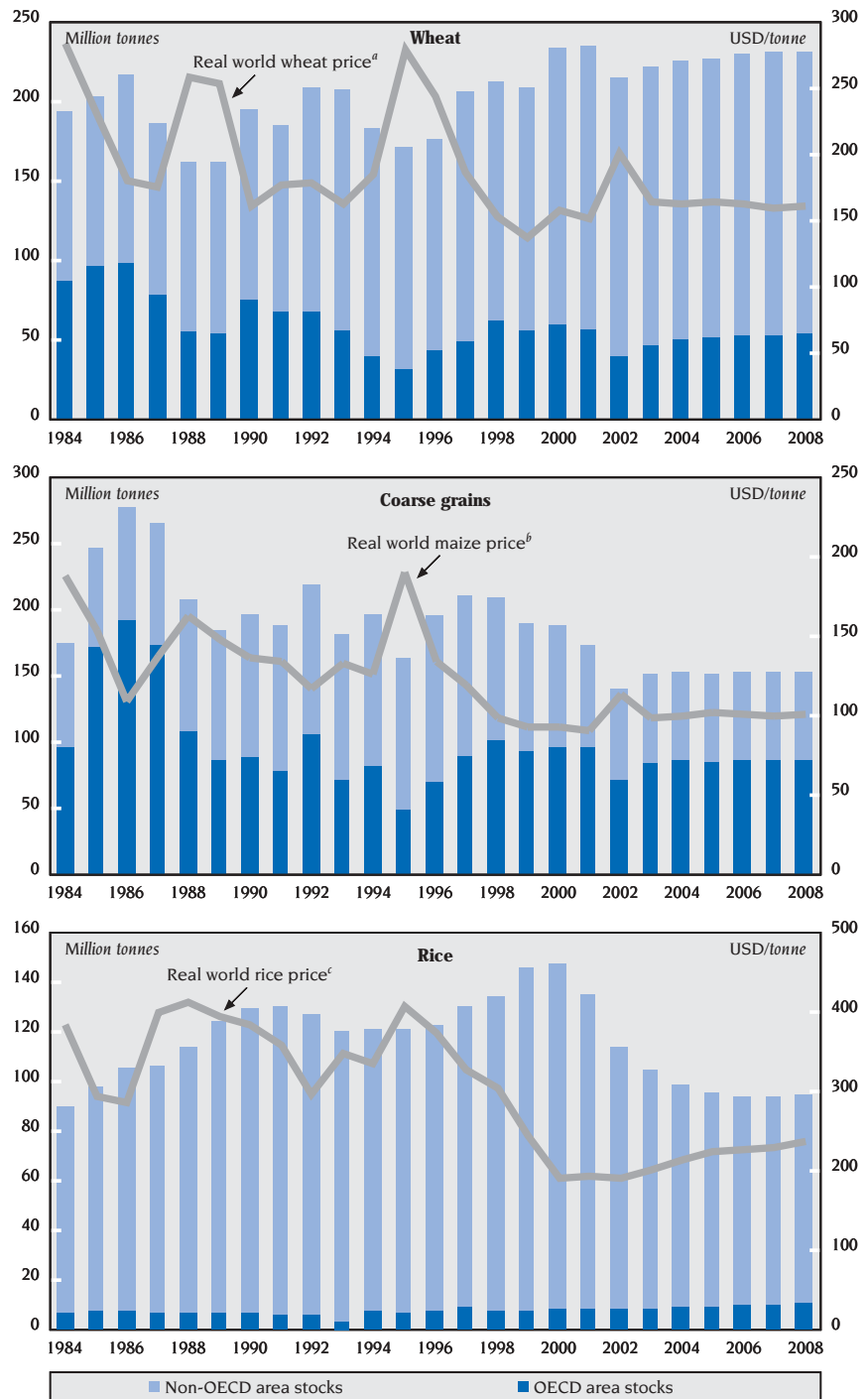
OECD recovers from recent drought

OECD grain market projections are strongly influenced by the recent droughts in Australia, Canada and the United States. Production in 2002 in these countries has been far below the levels observed in previous years. However, as domestic use of cereals generally has responded only to a limited extent, both cereal stocks and trade from these major exporters have been reduced significantly. Production in these countries is expected to recover by 2003, but exports in many cases will increase to previous levels only with some delay as supplies will first be used to rebuild stocks.

EU subsidised exports continue for some coarse grains...

Despite slight increases in world prices, and lower support prices following the Agenda 2000 reforms, the European Union is not expected to export significant quantities of feed grains without subsidies. While malting barley exports should remain unsubsidised, and food aid quantities assumed to

Figure 6. **Real prices hardly change after 2003 for wheat and maize, but increase for rice**



Note: All prices deflated to 2002 USD using the US GDP deflator.

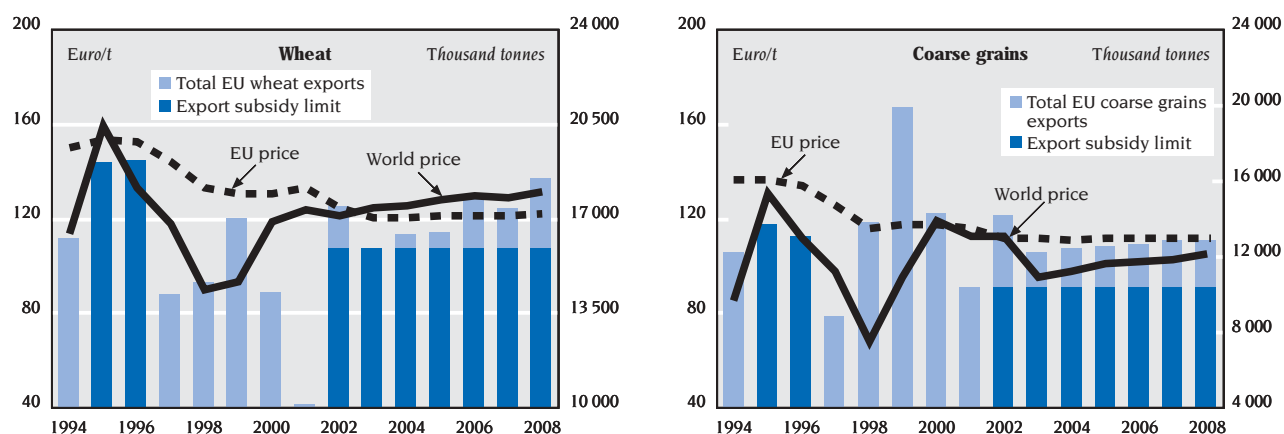
a) No. 2 hard red winter, ordinary protein, wheat, USA, f.o.b. Gulf Ports.

b) No. 2 yellow corn, USA, f.o.b., Gulf Ports.

c) Milled, grade b rice, f.o.b. Thailand.

Source: OECD Secretariat.

Figure 7. EU exports wheat without subsidies, but feed grains exports rely on refunds



Notes:

World prices:

From 1993 to 2001 historical prices FOB Rouen, calculated as simple averages of monthly prices.

From 2002 to 2007, projection values are *Aglink* world market prices for wheat and coarse grains, adjusted for quality differences, expressed in Euro per tonne. For 2002, lower wheat prices from the Black Sea region taken into account.

EU prices:

Adjusted *Aglink* domestic producer prices for wheat and barley, taking into account domestic transport costs.

In addition, corrections reflect that producer prices are average prices of soft and durum wheat, and of feed and malting barley, respectively, expressed in Euro per tonne.

Source: IGC and OECD Secretariat.

... but not for wheat and malting barley

remain flat, exports of both rye and feed barley depend on export refunds. Total coarse grain exports are therefore not expected to reach the high levels observed in the 1999 to 2002 period, within the next few years. Declining areas under production particularly for barley, however, helps to prevent accumulation of large intervention stocks of coarse grains, which are projected to be about as large in 2008 as in 2002. In contrast, as world prices are sufficiently high, export subsidies are not expected to be necessary for large parts of EU wheat exports, which should exceed 19 million tonnes by 2008 and thus eliminate any need for longer-term intervention stocks (see Figure 7).

EU rice policy becomes unsustainable as stocks grow substantially

The European rice policy is projected to become unsustainable in the near future. The reduction of import tariffs for significant amounts of rice originating in some of the least developed countries in Asia and Africa, following the signature of the *Everything But Arms* (EBA) initiative, the EU is expected to direct an increasing share of domestic production into intervention stocks. The market projections, which are based on a continuation of the policy stated in the Berlin Agreement of 1999 (Agenda 2000), show a steep increase in both rice imports and stocks after 2006. By 2008, one year before the EBA induced tariff reductions are scheduled to be complete, imports would reach 1.4 million tonnes, almost 70% of domestic consumption. Because domestic use is expected to respond little even to the sharply lower prices and producers are shielded from price falls (therefore keep slowly increasing both area and yields), about half the 2008 production would go into stocks which are projected to reach 1.8 million tonnes, three times the current level.

Australia production and exports to rebound

Australian wheat and coarse grain exports are projected to rebound after their current drought-induced declines. A large part of this sharp recovery occurs in 2003, when yields come back to trend levels. With domestic use largely stagnating, increasing barley and oats yields allow for a 4% p.a. growth in coarse grain exports between 2003 and 2008 despite declining areas. The area is projected to be shifted to wheat, and together with steady but slow yield progress, would allow wheat exports to exceed 16 million tonnes in 2008.

As Japan's grain markets mature, imports fall

With Japan's population size estimated to reach its maximum in 2004, grain consumption in this country is projected to fall over the outlook period. As Japanese livestock production is projected to be largely unchanged, both wheat and coarse grain use for feed are expected to continue their gradual decline which is not offset by some shift from rice to wheat-based, western-style food. Wheat imports should therefore continue to fall gradually, so that the Japanese tariff rate quota remains to be under-filled slightly, while coarse grain imports are projected to remain flat after recovering from the 2002 decline. Rice consumption is expected to continue its downward trend. Together with some growth in production due to productivity gains (assuming unchanged area under the rice land diversion programme), this should cause imports to decline by almost one-fifth over the Outlook period and to just under-fill the TRQ for rice.

Exports by Brazil and Argentina grow, but at a slower pace

The expansion of harvested area, in addition to yield growth, allows Brazil and Argentina to significantly increase their cereal production. Even though most of the new crop land goes to oilseed production in Brazil (see the Oilseed chapter for details), Argentina and Brazil are expected to extend their cereal area by 4% and 6% over the Outlook period, respectively, giving rise to additional production of 21 million tonnes. While domestic use of cereals in these countries increases as well, there is considerable scope for rising exports of maize from Brazil, and particularly wheat from Argentina.

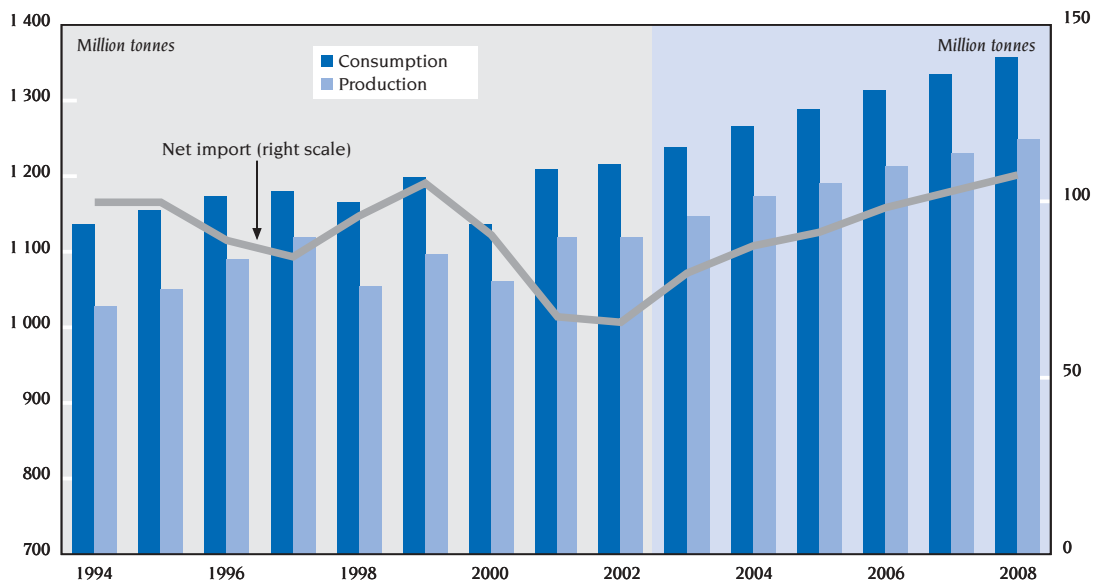
China's grain TRQs not filled, despite rising imports

With almost 20% of global wheat, coarse grain and rice production and consumption, China has become a member of the WTO in 2002. With increasing tariff rate quotas for wheat, maize and rice (among other commodities) and a decreasing role of government-run trade enterprises, the country has taken steps to potentially open-up domestic markets for significant grain imports. Within the projection period, China is not foreseen to fill the quotas, however. Nonetheless, this vast market is expected to more than quintuple its wheat imports and to almost triple coarse grain imports. By 2008, China is projected to be a significant net importer of both wheat and coarse grains, although the role of imports remains small compared to the dominant share of consumption drawn from domestic production. Rice imports are also projected to increase significantly in relative terms, but at low levels, and the country should remain an important net exporter of rice due to slowly declining consumption.

Increased livestock production to boost feed use in Russia

With pork and poultry production increasing by 11% and 54%, respectively, the Russian livestock industry is projected to absorb large quantities of feed grains. Particularly wheat use for feed is set to expand significantly, as the lower-quality supplies may become more difficult to sell

Figure 8. **Growing net cereal imports of non-member Economies**



Note: Cereals compose: wheat, coarse grains and rice.
Source: OECD Secretariat.

on international markets. Coarse grains feed use should increase less rapidly between 2002 and 2008. With further small increases in food consumption, and yield growth limited by a shortage in capital and other inputs, current levels of grain exports are unlikely to be maintained. Net wheat exports are expected to decline by 3.4 million tonnes or 54%, while the current coarse grain surplus should disappear altogether.

Increasing OECD exports to NMEs...

... except for rice

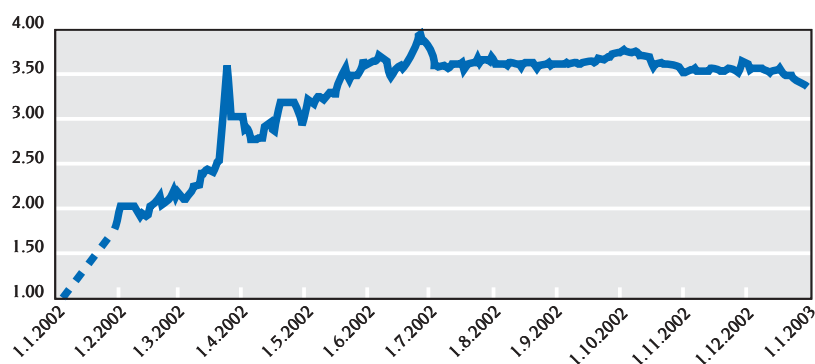
Global trade in cereals is projected to increase. While non-member Economies have gained increased shares in wheat exports over the last two decades, and particularly in the recent past following lower harvests in the OECD, NME wheat exports should not change much in the next years. Meanwhile, trade from major OECD exporters should recover from its current low quantities. As virtually all of the additional wheat trade would go to NMEs, the net exports from OECD countries to other regions are projected to increase substantially. In contrast, NME exports of coarse grains are projected to decline only slightly in favour of larger OECD exports. World trade in coarse grains should continue to increase at a moderate pace, while net OECD exports of coarse grains are expected to more than double between 2002 and 2008. Growth in rice trade is projected to slow down as consumption grows at a slower pace. With the opening of EU rice markets to the least developed countries, and subsequent large imports to the EU, the OECD net rice exports are projected to drop significantly after 2006 (see Figure 8).

Box 2. Argentina: Market implications of the economic crisis

Introduction

The financial and economic crisis in Argentina, starting with the float of the Argentinean Peso early last year, has brought about considerable changes in the overall economy of the country. Not only has the exchange rate to the US dollar more than tripled and is expected by the World Bank to further depreciate, but other macroeconomic indicators show significant changes as well. This box provides an analysis of the changes both in the macroeconomic environment and the agricultural markets of Argentina, based on the OECD *Agricultural Outlooks* of 2002 (which essentially excluded these developments) and 2003 (which takes them into account). Even though not all changes in the most recent developments and in the projections can be attributed to the economic shock and continuing macro disturbances, an examination of the differences in these projections, which are largely driven by Argentina's market expectations, may help to understand the market implications in a qualitative way. This may be superior to an analysis based on simulations with models which generally are suited for small shocks only, such as the *Aglink* model.

Figure 9. Development of the Argentinean exchange rate in 2002



Source: Data from Bank of Canada (2003).

The macroeconomic environment

As can be seen from Figure 9, the exchange rate of the Argentinean Peso, which used to be fixed to the US dollar at a rate of 1:1 until early 2002, rapidly depreciated to more than 3.5 Pesos/USD before levelling off in the second half of the year 2002. In fact, the 2003 Outlook assumes a further devaluation to 5.9 Pesos/USD by 2008, based on the latest World Bank projections. At the same time, other macroeconomic indicators are significantly affected as well. Not only does inflation rise with the depreciating currency, but economic growth is expected to suffer significantly as well (see Figure 10).

Figure 10. Main macroeconomic assumptions for Argentina in the OECD *Agricultural Outlooks* 2002 and 2003



Source: OECD Secretariat.

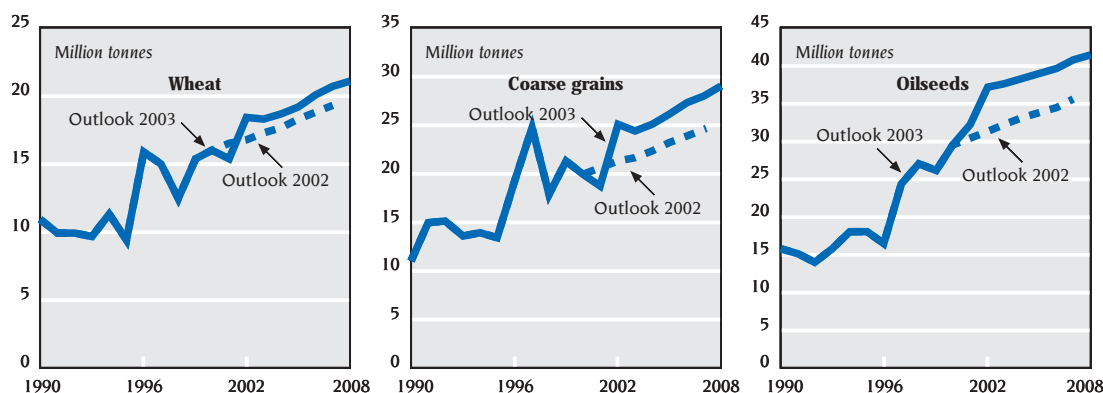
Changes in the projections for Argentinean markets

To evaluate the implications of these major economic turbulences, model simulations, though seeming straightforward at first glance, cannot give reliable answers. Even though the *Aglink* model takes into account changes in production costs that are projected to increase significantly due to depreciating exchange rates, the model cannot be expected to properly respond to a reduction of the real exchange rate of more than 60%. The projections made last year and published in the 2002 edition of the *OECD Agricultural Outlook*, and the current baseline, are largely driven by Argentina's market expectations. A comparison between these projections might therefore be expected to give some useful insight as to the likely agricultural market impacts of the large macro changes. It should be clear, however, that some differences are caused by other factors as well, including differences in international price projections when country results are combined in making a consistent set of world and OECD wide projections. The analysis presented in this box should therefore not be taken as a complete economic analysis of sectoral adjustments resulting from large macro economic shocks.

Crops

Grain production in 2001 (*i.e.* before the devaluation) has generally been revised downwards. Nonetheless, the current baseline projections for a similar period of 2002 to 2007 significantly exceed those published last year under a context of stable macroeconomic projections. Wheat, coarse grains and oilseed production has shifted upwards by between 7% and 20% in the current baseline, relative to last year's, with larger increases for oilseeds and coarse grains than for wheat, and a comparatively stronger shock in 2002 than thereafter (see Figure 11). This may partly be attributed to higher international grain and oilseed prices, but the magnitude of the shift indicates that the higher domestic prices due to the weaker exchange rate are only partly offset by increased production costs (through inflation), which would increase in nominal terms in line with the ongoing depreciation of the Peso for tradable inputs, and depending on inflation for non-tradable ones. Clearly, both output price and input cost changes matter, with a final effect of increased net returns that boost domestic crop supply.

Figure 11. **Argentinean crop production: Historical development and projections in the OECD Agricultural Outlooks 2002-2007 and 2003-2008 (million tonnes)**



Source: OECD Secretariat.

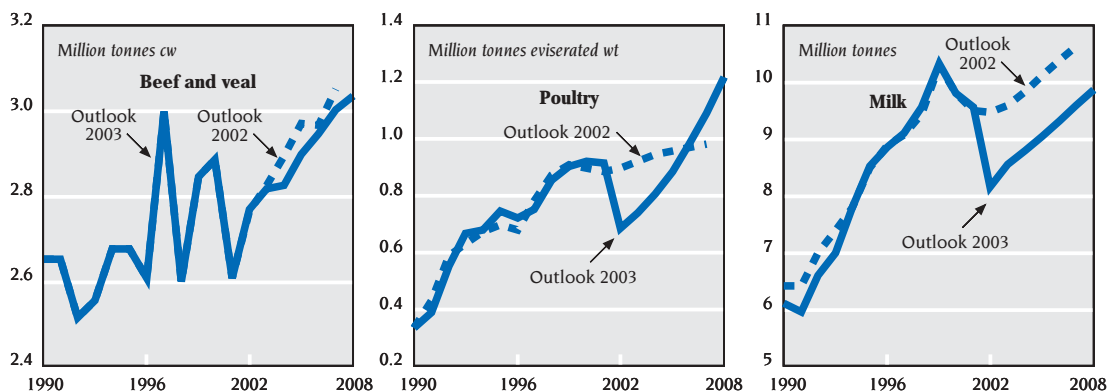
Due to the deterioration in income and higher meat prices for consumers, however, consumption of the basic foodstuffs grains is also projected to rise above the levels foreseen in last year's *Outlook*. Therefore, the scope for an increase in grain exports is lower than suggested by the boost in cereal production.

Box 2. Argentina: Market implications of the economic crisis (cont.)

Livestock

Meat production is affected by several factors related to the economic situation in Argentina, as well as by other external forces. Higher output prices in domestic currency terms following the devaluation are offset to some extent by increased feed prices in terms of the profitability of livestock production, particularly for non-ruminant meats. Beef and milk production from pasture additionally face competition against increased profitability of crop production that tends to expand by reducing the amount of pasture land. Declining domestic demand for higher-value processed products due to lower purchasing power of domestic consumers following the devaluation additionally puts pressure on livestock producers in terms of lower demand. Increased competition with Brazil, whose meat exports have also become more competitive due to the devaluation of the Real, reduces some of Argentina's advantage in international markets in terms of a weaker currency. Finally, beef production is also on the path to recovery from the recent outbreak of the food and mouth disease (FMD), although little change is foreseen for the size of the cattle herd and most of the projected increase in beef meat supply would come from increased animal weights. Overall, livestock production, and particularly poultry and pork supply, is projected to be well below last year's Outlook figures. Poultry production in 2002 was 24% lower than expected for this year in last year's baseline, and milk production was 14% lower. While relative changes between baselines in the beef and pork trade projections are small, the reduced poultry consumption also results in increased poultry exports, which could now represent up to 10% of Argentinean production.

Figure 12. **Argentinean livestock production: Historical development and projections in the OECD Agricultural Outlooks 2002-2007 and 2003-2008**



Source: OECD Secretariat.

Conclusion

The ongoing depreciation of the Argentinean Peso, together with other large perturbations in other macroeconomic variables, has significant implications for the agricultural markets. Higher prices (in domestic currency terms) and lower real incomes reduce food consumption of livestock products, and boost the profitability of crop production and exports. This can largely be seen in the comparison between the two sets of projections provided in last year's *Outlook* and the current baseline. However, several other factors also create different market outcomes, most notably higher international crop prices, and the increased competitiveness of Brazilian agriculture after the further devaluation of the Real.

It should be noted that the analysis shown in this box can only give a rough idea of production effects for crops and livestock products, and should not be taken as a scientific analysis of market impacts and resource implications due to large macro economic upheavals. A strict comparison variable by variable may therefore not always give a clear picture on the impact of the macroeconomic shock. It is for this reason that the discussion in this box was largely restricted to supply responses.

Key issues and uncertainties

EU Mid-Term Review may affect the outlook...

The European Commission has published a communication for the Mid-Term Review (MTR) on the Common Agricultural Policy in July 2002, and in January 2003 the Commission adopted a formal proposal. As no decision has been made at the time of writing this outlook, the policies signed in the Berlin Agreement of 1999 are assumed to continue for the outlook period. Yet changes in grain policies due to the MTR could be substantial. Lower intervention prices and higher payments in a more decoupled form would affect domestic production, use and trade of wheat and coarse grains. Even more importantly, the proposed cut in the rice intervention price by 50% accompanied by increased direct payments and their partial decoupling are likely to help prevent the unsustainable increase of intervention stocks discussed earlier.

... as may enlargement of the European Union

Any enlargement of the European Union, scheduled to begin in 2004, is not taken into account in these projections. Impacts of the accession can be expected to be rather different across accession countries, depending on the current policies relative to those in the EU, structure of the agricultural sector and other factors. In general, however, as most accession countries have already started to adjust their policies towards those in the EU, implications for international markets might be relatively small. A special section in this Outlook report, provided by the European Commission, evaluates the market impacts of the EU enlargement.

Under different settings, the FSRI Act may have more pronounced impacts on world markets

The US FSRI Act has relatively little impact on world markets in the context of the current world price projections, as Box 3 shows. Prices for coarse grains are somewhat lower, and those for oilseeds slightly higher, than what would have been the case had the FAIR Act provisions been continued to be applied, while wheat prices are hardly affected at all. However, this to a large degree depends on the settings on international markets. With crop prices lower than projected, the 2002 Farm Act would cause significant cereal price reductions, whereas the increase in oilseed prices would be less pronounced. On the other hand, with higher price projections, the Farm Act's implications for world markets would virtually vanish altogether.

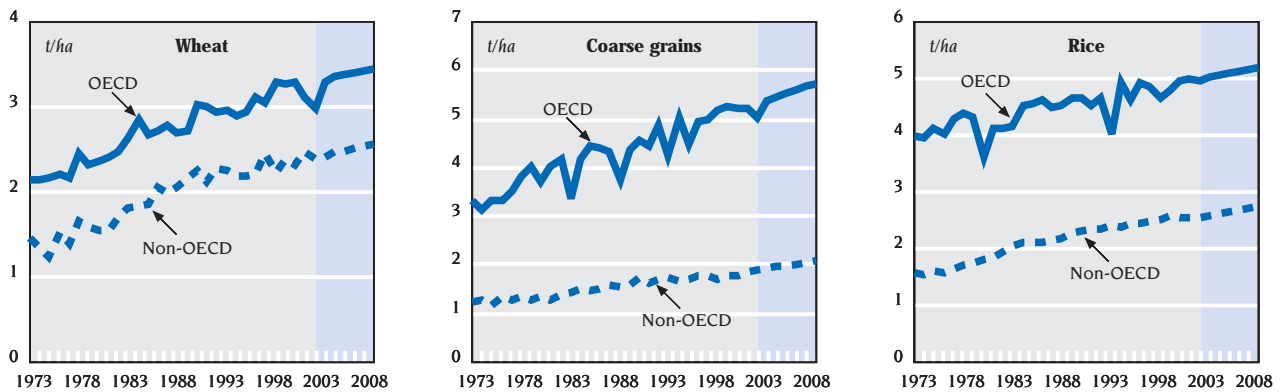
Impacts of China's WTO accession remains uncertain

The implications of the Chinese WTO membership still remain uncertain. While the projections outlined above include some increase in grain imports, none of the expanded import quotas for wheat, maize and rice is expected to be filled within the projection period, mostly due to administrative and other barriers. The implications of these quotas being filled on grain and meat markets is discussed in the Box 5.

Productivity growth remains an issue...

International grain prices are projected to remain largely unchanged in real terms after 2003. This is largely due to the continued growth assumed in crop productivity (see Figure 13), as well as from some new land coming to grain production in Latin America. While there are no indications that productivity growth would change dramatically in the short term, longer term projections are subject to significant uncertainty. The rate of yield growth

Figure 13. **Average cereal yields to continue steady growth**



Source: OECD Secretariat.

depends on potential progress of new breeding technologies, environmental pressures, as well as economic incentives and disincentives.

... particularly in Russia

This Outlook expects a relatively modest growth in Russian crop yields, somewhat below the high levels observed in the recent past. However, as discussed in the last *OECD Agricultural Outlook 2002-2007*, massive improvements in capital availability and the use of inputs due to increased engagement of capital donors outside the agricultural sector itself could gradually change the situation. It is obvious that with stronger productivity growth, Russia could maintain its exports particularly of wheat. Similarly, other countries of the Former Soviet Union have exhibited considerable export potentials in the recent past. While none of the other FSU countries are treated individually in the projections, a special section of this *Outlook* report discusses the driving forces behind market projections for the Ukraine.

Uncertain growth of livestock consumption and cereal feed use

Much of the increase in grain use is projected to stem from increased livestock production. Indeed, there remains a great deal of potential for more meat and dairy consumption in many developing countries in light of income growth. However, the expansion in cereal feed use may be undermined by lower economic prospects or smaller-than-expected income responsiveness, as well as a shift towards the more feed-efficient poultry meat. In consequence, this may lead to lower growth in net imports by non-member Economies than projected.

Huge Chinese stocks could flood grain markets

Chinese grain stocks have increased substantially during the last three decades and reached stock-to-use ratios in the late 1990s well above global averages. More recently, the Chinese administration has seemed to be willing to reduce expensive stockholding, and wheat, coarse grain and rice stocks have declined significantly. While the projections include a further reduction at lower rates, stock-to-use ratios remain high compared to other countries. A faster and more far-reaching depletion of grain stocks would change market outcomes to a considerable degree. In particular, if the additional supply

Box 3. Market implications of the 2002 United States' FSRI Act

Introduction

In May 2002, the United States Farm Security and Rural Investment (FSRI) Act was signed into law to replace the Federal Agricultural Improvement and Reform (FAIR) Act of 1996. The 2002 Farm Act comprises a wide range of programmes for commodities, conservation, trade, nutrition, credit, rural development, research, forestry, and energy. While a broader discussion of the new Farm Act is contained in the 2003 edition of the report on *Agricultural Policies in OECD Countries: Monitoring and Evaluation*, this box summarizes the main results of the market impact analysis.¹ As such, it is restricted to a subset of programmes including the Marketing Loan Assistance Program (MLAP), the Direct Payments for Crops (DPC), Counter-Cyclical Payments (CCP), and the Conservation Reserve Program (CRP), as well as dairy price supports and direct payments to milk producers. In addition, the discussion in this box is limited to the commodities represented in the Aglink model, grains, oilseeds and dairy, while effects on the meat markets are ignored. As a significant implication of both the MLAP and the CCP is the change in revenue risk faced by farmers, the Aglink model was modified not only to capture the new policy measures, including the associated risk elements. On the other hand, the effects of the CRP expansion on individual crop areas are taken into account by exogenous assumptions based on preliminary work done by the US Department of Agriculture.

It should be noted that the impact of the 2002 Farm Act, as it is estimated in this analysis, strongly depends on a number of assumptions, most notably the degree of farmers' risk aversion, and the settings of world markets as indicated by international commodity prices (see results of the sensitivity analysis). Indeed, the analysis was based on a preliminary baseline prior to this *Outlook* report, which projected slightly higher world prices, and therefore results in somewhat smaller impacts particularly on coarse grain markets compared to what would have been the case under final baseline conditions. The analysis also ignores some elements of the Farm Act, in particular the issue of Country of Origin Labelling (see Box 6), and the farmers' option to update base acreage and yields, which could have some production increasing effect if farmers anticipate further update possibilities in future legislation.

Main provisions of the FSRI Act

The *marketing loan assistance program* (MLAP) for cereals, oilseeds and other commodities is re-authorised with modified loan rates, and extended to some additional products in the FSRI Act. *Loan rates* are set at a fixed level for the years 2002 and 2003 and then reduced slightly for the period 2004-07 for many commodities. For most products, loan rates are higher than those in 2001 throughout the entire period, with the exceptions of rice (unchanged rate) and soyabeans (reduced rate).

Direct payments for crops (DPC) replace the *production flexibility contract payments* (PFCP) provided under the 1996 Farm Act. In addition to grains, cotton and rice, the DPC are extended to other crops, including oilseeds. DPC are based on fixed rates, multiplied by base yields and 85% of base areas for each crop. Payment rates by commodity as set for the 2002-07 period are higher than those paid in 2001.

Counter-cyclical payments (CCP) represent a new form of support for grains, oilseeds and other commodities, replacing the ad hoc *Market Loss Assistance Payments* provided during the 1998-2001 period. *Target prices* specific to each commodity are set initially for the years 2002-03 and then increased for the period 2004-07 for most commodities. Unlike the DPC, the CCP rate for a given crop depends on market prices and is calculated as the difference between the target price minus DPC rates and the higher of the loan rate and the market price. For both DPC and CCP, farmers may opt to update their base areas by choosing between two alternative ways of calculation. If they do update, they are also allowed to update base yields applicable for CCP (but not for DPC).

The *dairy* market price support programme and the *Dairy Export Incentive Program* (DEIP) are extended in the new legislation. The milk marketing order system was left unchanged, and a new deficiency payment is added. Dairy market price support will be continued. The support price for milk remains at USD 218 per tonne, and the Commodity Credit Corporation (CCC) will continue to buy any butter, cheddar cheese, or non-fat dry milk that is offered at announced prices. A new *National Dairy Market Loss Payment Program* is introduced for the period 2002-05 to provide a monthly payment to dairy farm operators equal to 45% of the difference between a target price fixed at USD 373.5 per tonne of milk and the monthly Class I price in Boston. This annual payment is limited to a maximum of 1 089 tonnes of milk per operation.

Finally, among other conservation programmes, the *Conservation Reserve program* (CRP) is expanded. Maximum set-aside area under the CRP is increased from 14.7 million hectares under the 1996 Act to 15.9 million hectares.

Box 3. **Market implications of the 2002 United States' FSRI Act** (cont.)

Incentive price effects for crops

Both the MLAP and the CCP have significant counter-cyclical dimensions. In other words, lower prices would trigger higher payments under both programmes and *vice versa*, thus reducing revenue risk faced by farmers. As farmers are assumed to be risk-averse (based on recent studies on farmers' risk behaviour²), they have an incentive to increase production for commodities showing reduced revenue risk. This analysis takes advantage of recent work in the OECD Agricultural Directorate to calculate risk premiums. The risk premium reduces producer prices in the calculation of crop returns. The higher the relative risk aversion and the greater the revenue risk, the more the risk premium reduces incentive prices for producers and, thus, provides a disincentive for the production of a particular crop.

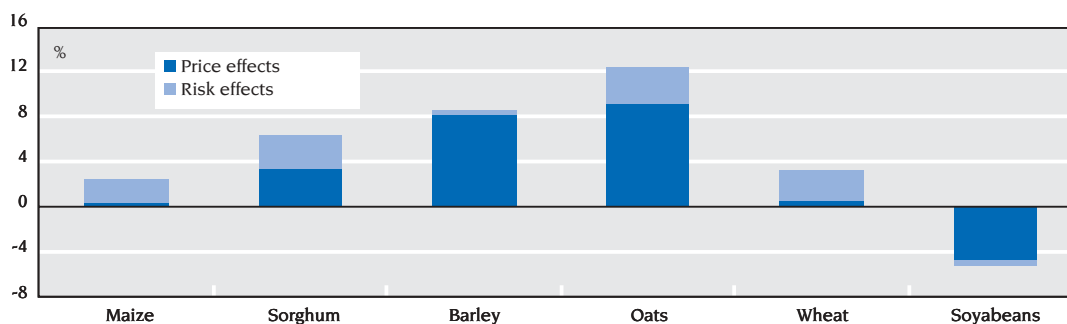
The MLAP and CCP are treated differently in the risk assessment for two reasons. First, the target prices of the CCP are additional to loan rates. They are used to supplement market prices that lie between the loan rate and the target price. Marketing loans are triggered when market prices are close to or lower than loan rates. Second, marketing loans provide payments which are tied to current production while the calculation of CCP payments are based on historical area and yield. Their impact on risk is different. Due to these two differences, the risk related impacts of CCP are, in general, smaller than those of marketing loans. However, if area allocated to a crop falls far below the level in the base period, the risk reducing impacts of CCP become larger, preventing production from falling.

Figure 14 provides an overview on the impact that the new Farm Act has on incentive prices. It shows that in addition to direct price effects risk effects represent an important element of the total picture. For the main cereals maize and wheat, reduced risk increases incentive prices by 2% and 3%, respectively, on average, due to rising loan rates and the introduction of CCP. At the same time, the lower loan rates for soyabeans leads to an increase in the risk premium (and a decrease in incentive price) by 0.5% on average.

Increased DPC, additional CCP and the increase in loan rates result in larger total benefits for grain producers, particularly for minor coarse grains where significant marketing loan benefits occur.³ Total payments (DPC and CCP) increase by 62%, on average, for 2002-2008, when compared to the former PFC payments provided under FAIR Act provisions. Additionally, the reduction in risk further increases incentives to produce grains. In contrast, benefits for soyabeans decline due to the reduction of the loan rate, and the increased risk. In total, incentive returns (*i.e.* after taking risk into account) decrease by some 5% on average for soyabeans, but increase by more than 10% for some coarse grains.

Figure 14. **2002 Farm Act impact on incentive prices**

Average 2002-2008



Source: OECD Secretariat.

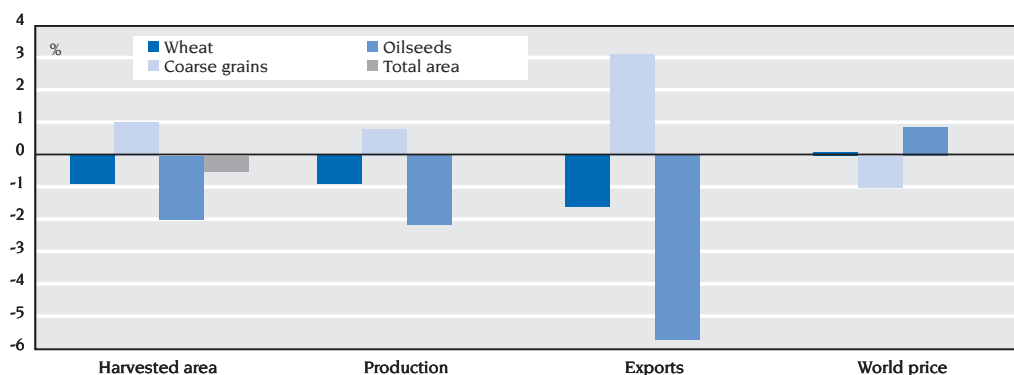
Crop market implications

Increased direct payments encourage an expansion of total cropped area or, conversely, prevent area decreases in response to falling prices. The expansion of CRP area influences total land allocation in the opposite direction. The net result is that total area harvested for grains and oilseeds falls by 0.5% on average from 2002-2008 as a result of the 2002 Farm Act. Relative to what would have happened under the 1996 FAIR Act

Box 3. **Market implications of the 2002 United States' FSRI Act** (cont.)

scenario, area slightly declines for wheat and expands for coarse grains, particularly for barley, oats and sorghum. At the same time, some decline in the area planted to oilseeds is attributable to the new policies (Figure 15). Production changes reflect the changes in support over the projection period, as loan rate support drops for oilseeds and increases for the less significant coarse grains. The CRP also has significant effects (as shown below). Market differences between the 1996 FAIR Act and the new FSRI Act generally peak in 2006, although they fluctuate slightly as producers react to lagged returns. Consumption effects occur exclusively in reaction to market price effects and are minor. Overall, the net effect is higher coarse grain exports, whereas wheat and oilseeds exports decline, when compared to the 1996 FAIR Act scenario.

Figure 15. **2002 Farm Act impact on crop markets**
Average 2002-2008

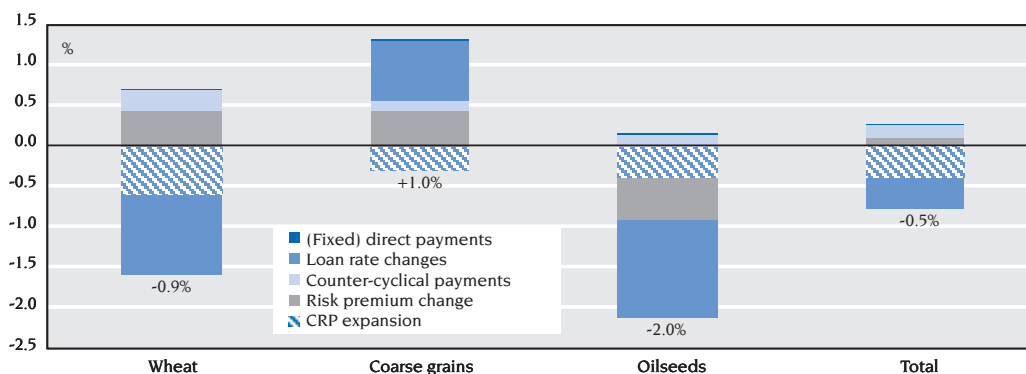


Source: OECD Secretariat.

The world price effects are also shown in Figure 15. The world wheat price is marginally increased, on average, over 2002-2008, with an initial reduction followed by some price increase towards the end of the simulation period under the 2002 FSRI Act relative to the 1996 FAIR Act scenario. World maize and barley prices average 1% lower under the FSRI Act, again with stronger price reductions in early years than in the later years. In contrast, world oilseed prices are 1% higher under the new farm legislation due to reduced US exports. As a consequence, world prices for oilseed meals and, to a lesser extent, vegetable oils are higher as well.

When looking at the decomposition of the total impact, it becomes obvious that changes in the loan rates are responsible for a large part of the market changes⁴ (Figure 16). In fact, these changes alone account for a 1.2%

Figure 16. **Composition of the 2002 Farm Act impact on harvested area**
Average 2002-2008



Source: OECD Secretariat.

Box 3. **Market implications of the 2002 United States' FSRI Act** (cont.)

area reduction for oilseeds, and a 0.8% area expansion for coarse grains, on average, for 2002-2008. As the loan rate increase for wheat does not become effective due to market prices exceeding both the new and old loan rates, the increased rates for coarse grains result in a significant reduction in wheat plantings. A second large factor is the change in risk due to both changed loan rates and the CCP. These risk changes cause a 0.4% increase in both wheat and coarse grain areas, on average, and a 0.5% reduction for oilseeds. The CRP expansion reduces total harvested area by 0.4%, on average, with stronger impacts for wheat than for coarse grains and oilseeds. Both DPC and CCP have relatively little impact on the area allocation, as the discussion below will show, under the projected levels of prices on international markets.

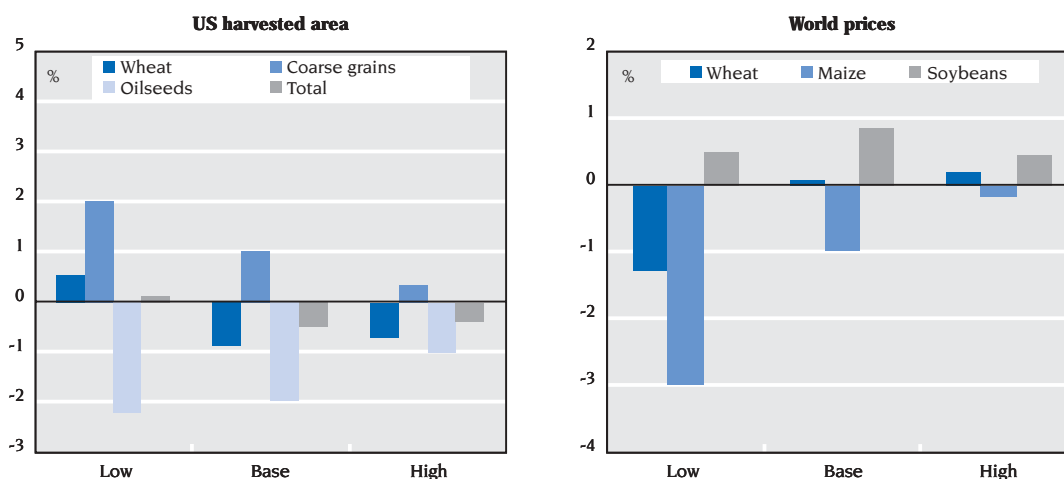
Sensitivity analysis on crop markets

The results outlined above have been found to be relatively sensitive with respect to two factors, *i.e.* the degree of risk aversion of farmers, and the conditions on world markets. Obviously, changing the assumption with respect to the degree of risk aversion mainly changes the risk element of the impact analysis, while different price projections would cause differences due to several mechanisms.

A sensitivity analysis with respect to the Relative Risk Aversion Coefficient (RRAC) shows that, if risk neutrality was assumed (RRAC = 0), the area increasing effect for wheat and coarse grains due to risk reduction would become zero, as would the area reducing effect due to the increased risk for oilseeds. Consequently, the 2002 Farm Act would lead to an even stronger reduction in wheat area, while the area expansion for coarse grains as well as the reduction for oilseeds would be less pronounced. A stronger risk aversion (RRAC = 5), in contrast, would result in the opposite effect: the reduction of wheat area would become almost zero, while the increase in coarse grain area and the decline in oilseed area would become stronger. The impacts on world prices would therefore be quite different under different risk aversion assumptions. With risk neutrality, wheat prices would increase by 0.4% on average while the reduction of maize prices would be 0.3% only on average over 2002-2008. On the other hand, with strong risk aversion the FSRI Act provisions reduce maize prices by almost 2%, on average, while increasing oilseed prices by 1%. Despite the lower production and exports, wheat prices would be slightly reduced as well due to cross price effects with maize.

The results prove to be even more sensitive with respect to the world market environment (see Figure 17). Under baseline conditions, loan rates for soyabeans are effectively supporting production, while the loan rates

Figure 17. **Sensitivity of world price effects: market impacts at 10% lower and 10% higher price projections**
Average 2002-2008



Source: OECD Secretariat.

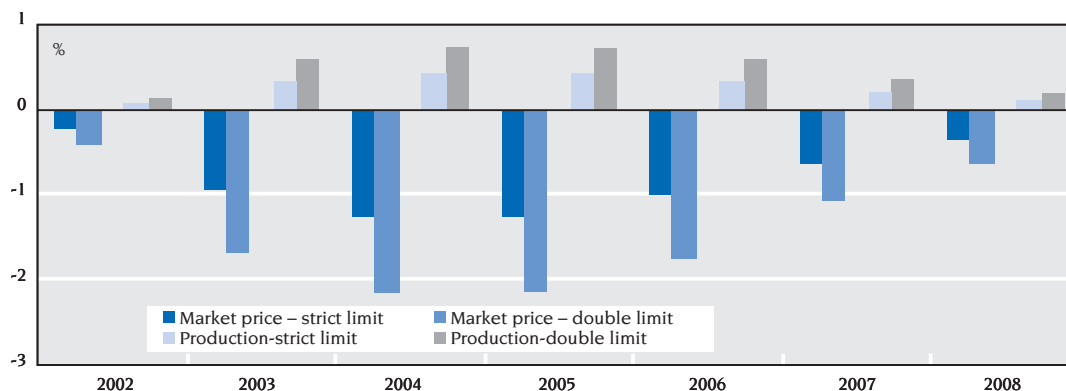
Box 3. **Market implications of the 2002 United States' FSRI Act** (cont.)

for most grains are below market prices. A 10% lower market price projection for 2003-2008 would therefore mainly change the impact of the higher loan rate for cereals, which now would result in significantly higher loan benefits and hence support, while the decrease in oilseed benefits is largely equal to the difference in loan rates. Both wheat and coarse grain area would be more strongly increased by the new Act (+0.5% and +2.0%, respectively, compared to -0.9% and +1.0%), while oilseed area reduction would not be much different from the main results above. In contrast, a 10% higher price projection would mainly change the impact of the loan rate decrease for soyabeans. As the market prices of soyabeans would then exceed the loan rates under either policy in most years, the difference in loan benefits becomes less significant. At the same time, the increase of cereal loan rates continues not to have much impact as prices would be well above the rates. In consequence, changes in harvested area would become much less pronounced for all crops. Wheat and oilseed area would be reduced by -0.7% and -1.0% on average, respectively, while coarse grain area would go up by 0.3% (compared to -0.9%, -2.0%, and +1.0%, respectively, if in the context of baseline prices). Under both higher and lower price projections than those in the baseline, the increase in world prices for oilseeds would therefore be smaller than those under baseline conditions. Similarly, while with higher price projections the increase in wheat prices would hardly be different from those under baseline projections, the new Act would result in a significant price reduction under low-price conditions. Maize prices would be reduced by 3% on average in this latter case, while a higher-price environment would lead to hardly any price reduction at all due to the 2002 Farm Act.

Dairy market implications

The main dairy market effects of the new Farm Act relative to the 1996 FAIR Act are presented in Figure 18. The additional support provided in the form of new direct payments, (assuming they are implemented strictly) and extended market price support has relatively small effects on US milk production. Milk production does rise by about 0.5% and milk market price falls by a little more than 1% as compared to the FAIR Act levels, but this is a transitory change and by the end of the Outlook period there are indications that these differences will not be sustained.

Figure 18. **US dairy results depending on payment limit implementation**



Source: OECD Secretariat.

There are two factors limiting the impacts of the 2002 FSRI Act on the US dairy markets. First, despite the fact that the FAIR Act does assume an elimination of dairy price support, the policy levers that are used to implement this scheme were expected to remain in use. Thus, the projected quantities and prices for US dairy markets would not change significantly as dairy product exports would continue to be supported through the DEIP and dairy product imports prevented through existing tariffs and tariff-rate quotas.

The second factor is the assumption that the new dairy payment will end in 2005, as mandated. Thus, from 2006, the effective producer price at the margin will no longer be above the market price. With producers responding only to domestic price signals, and production expanding in response to the higher effective price of the early years of the new Farm Act implementation, returns to producers are expected to be lower than they would

Box 3. Market implications of the 2002 United States' FSRI Act (cont.)

have been under the 1996 FAIR Act. Allowing some time for adjustments in production, these effects may become quite small over time. Of course, the temporary nature of the dairy payments may be questioned, particularly in light of the routine continuation of market price support despite termination provisions in the 1996 Act.

A sensitivity test has been made regarding the assumption that the payment limit will not be circumvented. Results are presented in Figure 18. In the scenario it is assumed that each operation is divided into two, thereby effectively doubling the 2.4 million pound limit to 4.8 million pounds. As a consequence, production increases by an estimated 0.74% relative to the 1996 FAIR Act. Higher production leads to lower prices, which are shown to fall by an estimated 2.16%. The payments provided to farmers above the limit might increase dairy product export subsidies or public stocks which follow from the rising production and falling prices.

Summary

The 2002 FSRI Act covers a broad range of provisions, of which only a subset were considered in this market impact analysis. While loan rates for soyabeans were lowered, and the area under conservation reserve program expanded, other support measures, including higher loan rates for most other commodities, as well as increased direct payments and the new counter-cyclical payments, could stimulate expansion of crop production and therefore put additional pressure on world market prices.

Under the conditions of the baseline projections, US wheat and oilseed production and exports decline slightly, while the supply of coarse grains would increase somewhat. It is shown that, in addition to the changes in the loan rates and the CRP area, differences in revenue risk represents an important factor for these impacts. Therefore, the results are sensitive with respect to farmers' behaviour with respect to risk: higher or lower risk aversion than assumed in the analysis will result in a stronger or less pronounced response in changes in revenue risk.

Even stronger sensitivity is found with respect to conditions on world markets. Indeed, the slight increases in wheat and oilseed prices, and the small decrease in coarse grain prices, are due to the particular levels of projected world prices. With lower price projections, the FSRI Act would result in more pressure on international grain markets, while higher prices would reduce the price increasing impact for oilseed markets.

Market impacts of changes in dairy policies are shown to be small and temporary. This conclusion is sensitive to the assumption that the payments limit for dairy farms will be enforced. If this is not the case, the impacts would be larger.

The FSRI Act tends to increase support to farmers, and to shift some support towards more distorting forms, while at the same time reducing the impact of increased support by setting aside crop area. The new US farm legislation institutionalises the Market Loss Assistance Payments that have been provided on an *ad hoc* basis since 1998, reduces risk for farmers and demonstrates a marked shift away from the goal of greater market orientation embodied in the 1996 legislation. Although the impacts of the 2002 Farm Act simulated in this analysis are small, the new Farm Act risks to accentuate production distortions and trade tensions and is not in line with the long-term OECD policy reform objectives.

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1. The discussion of both the provisions of the FSRI Act and the market impacts in this box highlights the main findings. For details and references see the main study.
 2. Available literature shows, that a plausible range for the Relative Risk Aversion Coefficient (RRAC) is between 0 (risk neutrality) and 5. The baseline assumes an RRAC of 2.
 3. The FAIR Act scenario assumes maximum loan rates provided by the Act, and no further ad hoc market loss assistance payments.
 4. Note that, when individual policy measures are discussed in this box, the associated risk effects are excluded, the total of which is treated separately. This is consistent with the representation in the *Aglink* model.

would not be used for larger livestock production, but to substitute for imports (or even for exports), the available quantities could put significant pressure on international grain prices for several years. While not treated explicitly in this outlook, Indian wheat stocks have reached large quantities as well, and despite the persistent problems in the grain marketing and handling infrastructure, further developments in these stocks represent a significant uncertainty for the market projections as well.

METHODOLOGY

The projections presented and analysed in this document are the result of a process that brings together information from member countries and a number of other sources. Consistency in this process is ensured by the use of the OECD's *Aglink* model. A large amount of expert judgement, however, is applied at various stages of the Outlook process. The OECD *Agricultural Outlook* presents a single assessment, judged by the Secretariat to be plausible given the underlying assumptions, the procedure of information exchange outlined below and the information to which it had access as of 25 April 2003.

The starting point of the outlook process is the reply by member countries (and some non-member Economies) to an annual questionnaire circulated by the Secretariat at mid-year. Through these questionnaires, the Secretariat obtains information from member countries on future market developments and on the evolution of agricultural policies in OECD countries. This information is supplemented by that obtained from other sources, such as the FAO, the World Bank or the IMF, to establish a view of the main forces determining market developments in the non-member Economies. This part of the process is aimed at creating a first insight into possible market developments and at establishing the key assumptions which condition the Outlook. The main economic and policy assumptions are indicated in the chapter on Economic and Policy Assumptions, and in specific tables of the present report. In a change to the previous procedure, the assumed medium term developments in main macroeconomic variables are based on December 2002 projections of the OECD's Economic Department. While sometimes different from macroeconomic assumptions provided through the questionnaire replies, it was judged preferable to use one consistent source for these variables.

As a next step, the OECD's *Aglink* model is used to facilitate a consistent integration of this information and to derive an initial set of global market projections (baseline). *Aglink* is a dynamic economic and policy specific model of major temperate-zone agricultural commodity markets. It currently consists of modules for ten main agricultural producing and trading countries, or groups of countries, within the OECD, a complete agricultural sector module for Argentina, Russia, China and Brazil (added this year) and a beef sector module for other MERCOSUR countries. A standalone sugar model has also been developed (and separate from the *Aglink* model at this stage), to produce a set of medium baseline projections for world and OECD sugar markets, covering raw and white or refined sugar. The modules are all developed by the Secretariat in conjunction with experts in member

countries and non-member Economies and, in some cases, with assistance from other national administrations. The initial baseline results are compared with those obtained from the questionnaire replies and any emerging issues are discussed in bilateral exchanges with country experts. On the basis of these discussions and of updated information, a second baseline is produced.

In addition to quantities produced, consumed and traded, the baseline also includes projections for nominal prices for the commodities concerned. Unless otherwise stated, prices referred to in the text are also in nominal terms.

The information generated is used to prepare reports presenting outlook assessments for cereals, oilseeds, meats, dairy products and sugar. These reports are discussed at the annual meetings of the Working Group on Meat and Dairy Products and the Working Group on Cereals, Animal Feeds and Sugar of the OECD Committee for Agriculture. The outlook discussions in the Working Groups focus on key issues emerging from the replies to the questionnaires and any adjustments which have to be made to member country projections in order to derive a coherent global baseline. Subsequent to the meetings of the commodity Working Groups and final data revisions, a revised baseline is produced and its sensitivity to major uncertainties evaluated. The revised projections form the basis of a draft of the present OECD *Agricultural Outlook* publication, which is normally discussed by the Working Party on Agricultural Policies and Markets of the Committee for Agriculture, prior to publication.

The above procedure implies that the baseline projections presented in this report are heavily conditioned by those developed by member countries and participating non-member Economies. It also reconciles inconsistencies between individual country projections through the use of a formal modelling framework and highlights the sensitivity of the outcomes to key assumptions. The review process ensures that the judgement of country experts is applied to the projections and related analyses. However, the final responsibility for the projections and their interpretation rests with the OECD Secretariat.

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Coarse grains production, export, stocks and price	(Oct. 2002), Buenos Aires, Argentina.
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Oilseeds production, import export crush	
Vegetable oils production, import export	
Oilseed meals production, import export	
Rice production, exports, stocks and price	
Milk production, liquid sales, industrial use	SAGPYA, Reply to OECD medium term questionnaire
Milk, butter, cheese, SMP and WMP prices	(Oct. 2002), Buenos Aires, Argentina.
Butter production, export	FAO, FAOSTAT PC database, Rome (2002).
Cheese production, export	
SMP production, export	
WMP production, import export	
Whey powder, net trade	
Beef balance	SAGPYA, Reply to OECD medium term questionnaire
Poultry balance	(Oct. 2002), Buenos Aires, Argentina.
Pork balance	
Egg balance	
Pigmeat, poultry and beef meat price	EAP, Buenos Aires, Argentina.
Consumption of all products	Calculated as production + imports – exports – change in stocks.

Australia

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Coarse grain production, feed use, trade, price	
Oilseed production, crush, trade, price	
Oilseed meal price	
Vegetable oils price	
Beef production, trade, price	
Pig meat production, trade, prices	
Poultry meat production, trade, prices	
Sheep meat production, trade, prices	
Milk production, liquid sales, industrial use, prices	
Butter production, trade, price	
Cheese production, trade, price	
SMP production, trade, price	
WMP production, trade	
Whey powder, net trade	ABARE, Reply to OECD medium term questionnaire, Canberra
	(August 2002).
Oilseed meals production, imports, feed use	USDA (November 2002), <i>PS&D Database</i> , Washington DC.
Vegetable oils production, imports	
Rice, production, exports	
Casein, net trade	
Consumption of all products	Calculated as production + imports – exports – change in stocks.

Brazil

Wheat utilisation, supply, price	Ministry of Agriculture, Reply to OECD medium term questionnaire, Brasilia (November 2002).
Coarse grains (except buckwheat, rye and other cereals) utilisation, supply, price	
Cotton, supply, price	
Soybean seed, meal and oil, utilisation, supply	
Sunflower, utilisation, consumption	
Beef utilisation, supply, price	
Pig meat utilisation, supply, prices	
Poultry meat utilisation, supply, prices	
Sheep meat utilisation, supply, prices	
Milk utilisation, liquid sales, industrial use, prices	
Butter utilisation, supply, price	
Cheese utilisation, supply, price	
SMP utilisation, supply, price	
WMP utilisation, supply, price	
Buckwheat utilisation, supply	FAO, FAOSTAT PC <i>database</i> , Rome (2002).
Other cereals utilisation, supply	
Oilseeds, meal and oil prices	
Rapeseed , production, supply	
Sunflower, trade	
Palm oil, utilisation, supply	
Rye, utilisation, supply	USDA (2002), PS&D <i>Database</i> , Washington DC.

Canada

Wheat production, exports, stocks, price	Agriculture and Agri-Food Canada (January 2003), CANSIM <i>Database</i> , Ottawa.
Coarse grain production, exports, stocks, price	
Oilseed production, crush, exports, feed use, price	
Oilseed meal production, imports, exports, price	
Vegetable oils production, imports, exports, price	
Beef production, imports, exports, price	
Pig meat production, exports, price	
Poultry meat production, imports, price	
Sheep meat production, imports, price	
Milk production, liquid sales, industrial use, prices, target return	
Dairy subsidy	
Butter production, exports, price, support price	
Cheese production, imports	
SMP production, exports, price	
Whey powder net trade	FAO, FAOSTAT PC <i>database</i> , Rome (2002).
Consumption of all products	Calculated as production + imports – exports – change in stocks.

China

Wheat balance, price	USDA China team, Washington DC.
Coarse grains price	
Rice balance, price	
Oilseed balance, price	
Beef balance, price	
Pig meat balance, price	
Poultry balance, price	
Milk price	
Coarse grains production, imports, exports, stocks	
Soybean oil balance	
Rapeseed meal balance	
Rapeseed oil balance	
Palm oil balance	USDA (January 2003), PS&D <i>Database</i> , Washington DC.
Milk production, industrial use, other use	FAO, FAOSTAT PC <i>database</i> , Rome (2002).
Whey powder net trade	
Butter production, imports, exports	
Cheese production, imports, exports	
SMP imports	
WMP imports, exports	
Consumption of all products	Calculated as production + imports – exports – change in stocks.

European Union

Wheat price	EUROSTAT (2002), OECD PSE <i>database</i> (2002), Meat and Livestock Commission, European Market survey, 2002.
Coarse grain price	
Rice price	
Poultry meat price	
Sheep meat price	
Milk price	
Pig meat price	Meat and Livestock Commission, <i>European Market survey</i> , 2002.
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Oilseed meal price	
Vegetable oil price	
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Rice production, imports, stocks	
Oilseeds production	
Beef and veal production, exports, imports, stocks, male bovine premium	
Pig meat production, exports, imports, stocks	
Poultry meat production, exports, imports, stocks	
Sheep meat production, imports	
Butter production, imports, exports, stocks	
Cheese production, imports, exports, stocks	
SMP production, imports, exports, stocks	
Oilseed crush, imports, stocks	ISTA Mielke GmbH, <i>Oil World Statistics</i> 2002, Hamburg.
Oilseed meals production, imports, exports, stocks	
Vegetable oils production, imports, exports, stocks	
Butter price	Agra Europe (2002), <i>Milk Products</i> , London.
Cheese price	
SMP price	
Consumption of all products	Calculated as production + imports – exports – change in stocks.

Hungary

Wheat production, exports, price	USDA (October/November 2002), <i>PS&D Database</i> , Washington DC.
Coarse grains production, exports, stocks, price	USDA (October/November 2002), <i>PS&D Database</i> , Washington DC.
Oilseed production, crush, exports, price	Reply to OECD medium term questionnaire (October 2002), Budapest.
Oilseed meals production, imports, price	Reply to OECD medium term questionnaire (October 2002), Budapest.
Vegetable oils production, imports	
Beef and veal production and price	
Pig meat production, exports, price	
Poultry meat production, imports, price	
Butter production, exports, price	
Cheese production, exports, price	
SMP production	
Milk production, liquid sales, industrial use, price	FAO, <i>FAOSTAT PC database</i> , Rome (2002).
Whey Powder net trade	
Consumption of all products	Calculated as production + imports – exports – change in stocks.

Japan

Wheat price	MAFF, <i>Monthly Statistics of Agriculture Forestry and Fisheries (various issues)</i> – Japan, Tokyo.
Coarse grain price	
Oilseed price	
Oilseed meal price	
Oilseed meal imports	
Wheat production, imports, stocks	MAFF, <i>Food balance sheet</i> , Japan, Tokyo.
Coarse grain production, imports, stocks	
Rice production, imports, stocks	USDA <i>PS&D Database</i> , Washington DC.
Oilseed production, crush, imports, stocks	
Oilseed meal production	
Vegetable oil production, imports, stocks	
Beef production, imports, price	MAFF, <i>Monthly Statistics of Agriculture Forestry and Fisheries (various issues)</i> – Japan, Tokyo.
Pig meat production, imports, price	ALIC, <i>Monthly Statistics (various issues)</i> , Japan, Tokyo.
Sheepmeat imports	USDA <i>PS&D Database</i> , Washington DC.
Poultry meat production, imports, price	
Milk production, fluid sales, industrial use, price, support price, transaction price, deficiency payment	
Butter production, imports, price, stabilisation price	
Cheese production, imports, price	
SMP production, imports, price, stabilisation price	
WMP production	
Consumption of all products	Calculated as production + imports – exports – change in stocks.

Korea

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Coarse grains price	
Rice price	
Oilseed price	
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Oilseed meals production, imports	
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Poultry meat production, imports, price	
Milk production, liquid sales, industrial use	
Butter production, imports	
Cheese production, imports	
SMP production, imports	
Whey Powder net trade	FAO, FAOSTAT PC <i>database</i> , Rome (2002).
Consumption of all products	Calculated as production + imports – exports – change in stocks.

Mexico

Wheat production, price	SAGAR, Reply to OECD medium term questionnaire (August 2002), Mexico City. CEA (Centro de Esta distica Agropecuaria), SAGAR, Mexico City. USDA (January 2003), PS&D <i>Database</i> , Washington DC and FAS reports.
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Beef production, price	
Pig meat production, price	
Poultry meat production, price	
Sheep meat production, price	
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Butter production	
SMP production	
Wheat support price	SAGAR (2002), Reply to OECD medium term questionnaire (August 2002), Mexico City.
Maize support price	
Cereal income payment	
Oilseed support price	SAGAR, <i>Medium Term Questionnaire Reply</i> (August 2002), Mexico City.
Soyabean income payment	
Milk production, price	
Milk liquid sales, industrial use	
Butter price	
Cheese price	
SMP price	
WMP price	
Consumption of all products	Calculated as production + imports – exports – change in stocks.

New Zealand

Wheat production, imports, price	MAF, Reply to OECD Questionnaire, Wellington,
Coarse grain production, price	(September 2002).
Beef production, exports, price	
Pig meat production, imports, price	
Poultry meat production, price	
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Milk production, liquid sales, industrial use, prices	
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Cheese production, exports, price	
SMP production, exports, price	
WMP production, consumption, exports, price	
Casein price	
Wheat feed use	
Coarse grain imports, feed use	
Butter consumption	
SMP consumption	
Whey powder net trade	FAO, FAOSTAT PC <i>database</i> , Rome (2002).
Casein, exports	USDA (January 2003), PS&D FAO.
Consumption of all products	Calculated as production + imports – exports – change in stocks.

Poland

Wheat production, imports	IERIGZ(86-96).
Coarse grains production, imports	USDA (September/October 2002), PS&D <i>Database</i> ,
Oilseed production, crush, imports	Washington DC.
Oilseed meals production, imports	Reply to OECD medium term questionnaire Warsaw,
Vegetable oils production, imports	(September 2002).
Pig meat production, exports, price	
Poultry meat production, imports, price	
Cheese exports	
Milk production, on farm use liquid sales, industrial use, price	WTO (81-84), GUS (88-90), IERIGZ (91-96), Reply to OECD medium term questionnaire Warsaw, (September 2002).
Butter production, exports, imports, price	
Cheese price	
SMP production, exports price	
Casein exports	USDA (September/October 2002), PS&D <i>Database</i> ,
	Washington DC.
Cheese production	GUS (89-95), IERIGZ (96), FAO FAOSTAT PC Database,
Whey powder net trade	Rome (2002).
Wheat price	GUS (86-96).
Coarse grains price	Reply to OECD medium term questionnaire Warsaw,
Oilseed price	(September 2002).
Oilseed meals price	
Vegetable oils price	
Beef production, price	
Consumption of all products	Calculated as production + imports – exports – change in stocks.

Russia

Wheat production, imports, exports, ending stocks	USDA (January 2003), <i>PS&D Database</i> , Washington DC.
Coarse grains production, imports, exports, ending stocks	
Oilseed production, crush, imports, exports	
Oilseed meals production, imports, exports	
Vegetable oils production, imports, exports	
Rice production, imports, exports	
Beef production, imports	FAO, <i>FAOSTAT PC database</i> (2002), Rome.
Pig meat production, imports	
Poultry meat production, imports	USDA (January 2003), <i>PS&D Database</i> , Washington DC.
Milk production	FAO, <i>FAOSTAT PC database</i> (2002), Rome.
Butter production, imports	USDA (January 2003), <i>PS&D Database</i> , Washington DC.
Cheese production, imports	
SMP production, imports, exports	
WMP production, imports	
Consumption of wheat, coarse grain, rice, oilseeds, oilseed meals, vegetable oils, beef, pig meat, poultry meat, sheep meat, butter, cheese, SMP and WMP	Calculated as production – imports + exports – change in stocks.
Prices	OECD <i>PSE database</i> (2003).

United States

Wheat production, imports, exports, stocks, price, EEP payment	USDA, <i>Wheat Outlook</i> (January 2003), Washington DC.
Coarse grains production, exports and price	USDA, <i>Feed Outlook</i> (January 2003), Washington DC.
Rice production, imports, exports, stocks and price	USDA, <i>Rice Outlook</i> (January 2003), Washington DC.
Beef production, imports, exports, price	USDA, <i>Livestock, Dairy and Poultry</i> (January 2003), Washington DC.
Pig meat production, imports, exports, price	
Poultry meat production, exports, price	
Sheep meat production, imports, price	
Milk production, liquid sales, industrial use, support price, prices	USDA, <i>Livestock, Dairy and Poultry</i> (January 2003), Washington DC.
Butter production, exports, stocks, price	
Cheese production, imports, exports, price	
SMP production, exports, stocks, price	
WMP production, exports, stocks	USDA <i>Dairy Yearbook</i> (2002), Washington DC.
Whey powder production, exports, price	
Casein imports	USDA (January 2003), <i>PS&D Database</i> , Washington DC.
Oilseed production, crush, exports, and price	USDA, <i>Oil Crops Outlook</i> (January 2003), Washington DC.
Oilseed meals production, imports, exports and price	
Vegetable oils production, imports, exports, stocks and price	
Wheat target price, loan rate, ARP area, CRP area, other land idled	USDA, <i>Agricultural Outlook</i> (2003), Washington DC.
Coarse grains ARP area, CRP area, other land idled	
Maize target price, loan rate	
Soyabean loan rate, CRP area	
Consumption of all products	Calculated as production + imports – exports – change in stocks.

Other OECD

Wheat production, consumption	Replies to OECD Questionnaires (September 2002). USDA (January 2003), PS&D <i>Database</i> , Washington DC.
Coarse grains production, consumption	
Oilseed production, crush, consumption	
Oilseed meals production, consumption	
Vegetable oils production, consumption	
Rice production, consumption	
Beef production, consumption	Replies to OECD Questionnaires (September 2002). USDA (January 2003), PS&D <i>Database</i> , Washington DC.
Pig meat production, consumption	
Poultry meat production, consumption	
Sheep meat production, consumption	
Milk production, on farm use, liquid sales, industrial use	Replies to OECD Questionnaires (September 2002).
Butter production, consumption	
Cheese production, consumption	
SMP production, consumption	
WMP production, consumption	
Net trade in wheat, coarse grain, rice, oilseeds, oilseed meals, vegetable oils, beef, pig meat, poultry meat, sheep meat, butter, cheese, SMP and WMP	Calculated as production – consumption – change in stocks.

OECD

Production of wheat, coarse grains, rice, oilseeds, oilseed meals, vegetable oils, butter, cheese, SMP, WMP	Calculated as Australia + Canada + EU + Japan + New Zealand + United States + Mexico + Korea + Poland + Hungary + other OECD.
Consumption of wheat, coarse grains, rice, oilseeds, oilseed meals, vegetable oils, butter, cheese, SMP, whole milk powder	
Imports of butter, cheese, SMP, WMP	
Exports of butter, cheese, SMP, WMP	
Stocks of wheat, coarse grains, rice, oilseeds, oilseed meals, vegetable oils, butter, cheese, SMP	
Feed use of wheat, coarse grains	
Oilseed crush	

Rest of World

Wheat production, stocks	USDA (December 2002), PS&D <i>Database</i> , Washington DC.
Coarse grains production, stocks	
Rice production, stocks	
Oilseed production, crush, stocks	
Oilseed meals production, stocks	
Vegetable oils production, stocks	
Net trade of wheat, coarse grains, rice, oilseeds, oilseed meals, vegetable oils, butter, cheese, SMP, WMP, whey powder	Calculated as – net trade of (OECD + RUS + Other Independent States + Brazil + China + Argentina)
Milk production, industrial use, other uses	Calculated as World – (OECD + RUS + Other Independent States + Argentina + Brazil + China).
Butter production	
Cheese production	
SMP production	
WMP production	
Consumption of all products	Calculated as production – net trade – change in stocks.

Chinese Taipei, India

Rice production, stocks

USDA (December 2002) *PS&D Database*, Washington DC.**Indonesia**

Rice production, imports, stocks

Thailand

Rice production, exports, stocks

Chinese Taipei, India, Indonesia, Thailand

Rice price

University of Arkansas rice database (2002), Fayetteville, USA.
USDA *FAS reports* (various issues), Washington DC.
IRRI *World Rice Statistics* (various issues), Makati, Philippines.

Consumption of all products

Calculated as production – net trade – change in stocks.

OIS (Other Independent States)Wheat production, net trade, ending stocks
Coarse grains production, net trade, ending stocks
Rice production, net trade
Oilseed production, crush, net trade, ending stocks
Oilseed meals production, net trade
Vegetable oils production, net tradeUSDA (January 2003), *PS&D Database*, Washington DC for FSU.
Calculated as FSU-RUS.Butter production, net trade
Cheese production, net trade
SMP production, net trade
WMP production, net tradeUSDA (January 2003), *PS&D Database*, Washington DC for FSU.
Calculated as FSU-RUS.Consumption of wheat, coarse grain, rice, oilseeds,
oilseed meals, vegetable oils, beef, pig meat,
poultry meat, sheep meat, butter, cheese, SMP
and WMP

Calculated as production – net trade – change in stocks.

WorldWheat production, feed use, stocks
Coarse grains production, feed use, stocks
Rice production, stocks
Oilseed production, crush, stocks
Oilseed meals production, stocks
Vegetable oils production, stocks
Butter, cheese, skim milk powder, stocksCalculated as Rest of world + OECD + Argentina + Brazil + China
+ OIS + Russia.Production of butter, cheese, skim milk powder, whole
milk powderFAO, *FAOSTAT PC database*, Rome (2002).

Wheat price

USDA, *Wheat Outlook*, January 2003.

Coarse grains price

USDA, *Feed Outlook*, January 2003.

Rice price

USDA, *Rice Outlook*, January 2003.

Oilseed price

ISTA Mielke GmbH, *Oil World Annual* 2002, Hamburg.

Oilseed meals price

Oilseed oils price

Palm oil price

Butter price

SMP price

USDA, *Dairy World Markets and Trade* (December 2002),
Washington DC.

Cheese price	USDA, <i>Dairy World Markets and Trade</i> (December 2002), Washington DC.
WMP price	USDA, <i>Dairy World Markets and Trade</i> (December 2002), Washington DC.
Whey powder price	USDA, <i>Livestock, Dairy and Poultry</i> (January 2002), Washington DC.
Casein price	New Zealand Dairy Board, <i>International Market Update</i> , Wellington.
Tariffs, tariff-quotas and subsidised export limits for OECD countries unless otherwise specified	GATT (1996), <i>Uruguay Round GATT Schedules</i> , Geneva.
Consumption of all products	Calculated as production – net trade – change in stocks.
Sugar	
Sugar production, raw and white exports, raw and white imports, consumption, stocks	FO Licht World Sugar Balances, 2002.

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ACRONYMS AND ABBREVIATIONS

Acronyms

ABARE	Australian Bureau of Agricultural and Resource Economics
ALIC	Agriculture and Livestock Industry Corporation
AMAD	Agricultural Market Access Database
AMS	Agricultural Marketing Service
ASEAN	Association of Southeast Asian Nations
BSE	Bovine spongiform encephalopathy
CEEC	Central and Eastern European Countries
CAP	Common Agricultural Policy (EU)
CCP	Counter-Cyclical Payments (US)
CIS	Commonwealth of Independent States
CoOI	Country-of-Origin Labelling
CPI	Consumer price index
CMO	Common Market Organisation for sugar (EU)
CRP	Conservation Reserve Program (US)
DEIP	Dairy Export Incentive Program (US)
DMLP	Dairy Market Loss Payment (US)
DPC	Direct Payments for Crops (US)
EBA	Everything-But-Arms Initiative (EU)
ECB	European Central Bank
ECU	European Currency Unit
EEP	Export Enhancement Program (US)
ERS	Economic Research Service of the US Department for Agriculture
EUROSTAT	Statistical Office of the European Communities
FAIR ACT	Federal Agriculture Improvement and Reform Act (US) of 1996
FAO	Food and Agriculture Organisation of the United Nations
FMD	Foot and mouth disease
FAS	Foreign Agricultural Service of the US Department for Agriculture
FSRI ACT	Farm Security and Rural Investment Act (US) of 2002
FTAA	Free Trade Area of the Americas
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GM	Genetically modified
GMO	Genetically engineered or modified plant, animal, micro-organism or virus
HFCS	High Fructose Corn Syrup
HS	Harmonised Commodity Description and Coding System
IMF	International Monetary Fund
MAF	Ministry of Agriculture and Forestry (New Zealand)
MAFF	Ministry of Agriculture, Forestry and Fisheries (Japan)
MERCOSUR	Common Market of the South
MLAP	Marketing Loan Assistance Program (US)
MLC	Meat and Livestock Commission (United Kingdom)
MFN	Most Favoured Nation
MPC	Milk protein concentrates
MTR	Mid-Term Review of the CAP (EU)
NAFTA	North American Free Trade Agreement
NIS	Newly Independent States
NME	Non-member Economies
NTBs	Non-Tariff Barriers
NZDB	New Zealand Dairy Board
OECD	Organisation for Economic Co-operation and Development
OIE	Office International des Epizooties
OMB	Office of Management and Budget (United States)
OTMS	Over Thirty Month Scheme
PFCP	Production Flexibility Contract Payments (US)
PSE	Producer Support Estimate
R&D	Research and Development
RR	Roundup Ready seed varieties
RRAC	Relative Risk Aversion Coefficient
RTAs	Regional Trading Arrangements
SARS	Severe Acute Respiratory Syndrome
SMP	Skim milk powder
SPS measures	Sanitary and phyto-sanitary measures
STE	State Trading Enterprises
TRQ	Tariff rate quota
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational Scientific and Cultural Organisation
URAA	Uruguay Round Agreement on Agriculture
US	United States
USDA	United States Department of Agriculture
VAT	Value added tax
WMP	Whole milk powder
WPC	Whey protein concentrates
WTO	World Trade Organisation

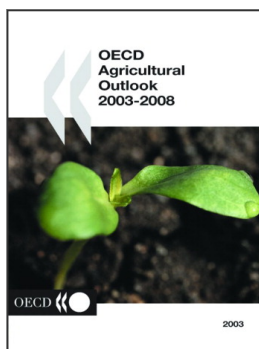
For an explanation of technical terms, see the *Glossary*

Abbreviations and symbols

ARS	Peso (Argentina)	Euro	European currency unit	mn	Million
AUD	Dollars (Australian)	f.o.b.	Freight on board	mt	Million tonnes
Bn	Billion	Ha	Hectare	NZD	Dollars (New Zealand)
CAD	Dollars (Canadian)	JFY	Japanese fiscal year (beg. 1 April)	pw	Product weight
c.i.f.	Cost insurance freight	JPY	Japanese yen	rse	Raw sugar equivalent
CNY	Yuan (China)	Kg	Kilogram	rtc	Ready-to-cook
cts/lb	US cents per pound	kt	Thousand tonnes	rw	Retail weight
Cwe	carcass weight equivalent	L	Litre	t	Tonnes
Dw	Dressed weight	lw	Live weight	t/ha	Tonnes per hectare
ECU	European currency unit	mha	Million hectares	USD	dollars (United States)

THE OUTLOOK IN BRIEF

- World production of agricultural products is projected to continue to expand over the period to 2008 with the mix of outputs shifting towards a larger share of livestock products and feedstuffs and a lower share of food grains. Continued productivity increases will account for the largest share of production growth. Most of the additional production of agricultural products over the Outlook will take place in non-member Economies (NMEs). However, their food consumption will grow even faster and will provide opportunities for increased production and trade with OECD countries, particularly for higher value processed products and feedstuffs.
- An expected rebound in OECD economic growth and revival of the world economy from 2004 onwards, supported by continuing, albeit slowing, population growth in NMEs leads to an increase in global demand for agricultural products. Much of the growth in world demand is expected to be reflected in increased consumption of coarse grains and oilseeds, with a shift away from wheat and rice based staple foods towards more processed food and higher protein products such as meats. The shift in consumption patterns is due mainly to higher per capita incomes and dietary changes in NMEs with only slow growth in food demand expected in mature OECD markets.
- Drought induced production adjustments and low demand lead to some divergence between cereal and livestock product prices at the beginning of the Outlook. As production rebounds, cereal and oilseed prices fall, improving the profitability of livestock sectors. Higher demand growth with the revival of the world economy leads to rising agricultural product prices over the medium term. Increasing crop and livestock product supplies over the Outlook period, and some rebuilding of global stocks, moderate the extent and pace of future price increases for most commodities.
- Trade in bulk and processed food products will continue to expand. The highest growth in net trade of OECD countries will be for cereals, followed by dairy products, when compared to the average volumes for 1997-2001. Some slowdown in OECD meat exports is expected due to faster internal consumption and intra-OECD trade, as well as increased competition in international markets.
- High farm support and protection in the OECD area and trade restrictions in a number of NMEs, continue to have a major impact on international agricultural markets. The pace of agricultural reform for particular commodities continues to be mixed, proceeding for some products and in some countries, but having slowed or halted for others. Further improvement in market orientation and lower market protection would improve the functioning of world commodity markets and the prospects for most participants. The WTO negotiations underway on agricultural trade offer an opportunity to pursue these goals. However, success in reaching an agreement acceptable to all participants and one which promotes a more liberal trading environment will require continued international cooperation and leadership by OECD countries.



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