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Agriculture in Poland and Hungary and the potential effects on the EU's agricultural policies

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Agriculture in Poland and Hungary and the potential effects on the EU's Agricultural Policies

Ministry of Foreign Affairs and Trade

NZ Trade Consortium Working Paper No. 14

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Executive Summary

The main **objective** of this paper is to examine the structure and performance of the agricultural sectors in Poland and Hungary and assess how accession to the European Union may impact upon these sectors. It also looks at how this accession may affect the European Union agricultural support system and its WTO commitments and New Zealand's agricultural exports to Europe.

Polish agriculture has many aspects of a self-sufficient economy, with very small and fragmented farms, high rural employment and low productivity and product quality standards. Official agricultural trade represents about 13 percent of exports and nine percent of imports, with the EU being the main market and source. Unofficial trade is thought to be about half that of official trade. Livestock products still comprise about one third of agricultural exports despite a reduction in dairy and beef cattle numbers and a decimation of sheep numbers over the last decade as the old support regimes crumbled. Processed foods and cereals are the main imports. Policies are starting to become more aligned with the CAP policies, with the latest OECD data indicating support levels climbing to a PSE of 25 percent (around half those found in the EU), with price supports the main vehicle for assistance delivery.

Hungary similarly has an important agricultural sector, but in contrast to Poland it is founded on a base of larger farms and enjoys considerable advantages in technological efficiency. Cereals are the main output, and as with Poland the farm production is split about 60/40 between crops (wheat and maize) and livestock. Exports are important to the sector, and Hungary faces a dilemma in that accession to the EU with its restrictive policies but large potential income transfers needs to be assessed against the potential for the sector to become internationally competitive. The food processing sector in particular has benefited from foreign investment and enhanced productivity. Producer prices are generally lower than EU prices (as is the case with Poland), although the sector is increasingly supported as the PSE increase from 7 percent in 1997 to the most recent 20 percent attests.

The **unresolved questions** for the aspirants are access to CAP direct payments, the quota regime implications for dairy and sugar, and the issue of product quality to meet EU standards. Until the first two are resolved any quantitative analysis of the impacts of accession upon the sector is speculative.

The results from computer **modelling** are consistent. The World Bank considers that an efficiency growth pathway is the best for Poland, otherwise distortions will be introduced. The USDA concludes that the expanded EU will be able to export more produce, but the effect of accession is marginal. The CEEC¹ become net wheat importers,

¹ Central and Eastern European Countries (CEEC). The so-called CEEC-5 are Poland, Hungary, the Czech Republic, Estonia and Slovenia. These five and Romania, Bulgaria, Slovakia, Lithuania and Latvia make up the so-called CEEC-10.

with Hungary a net exporter, and increased beef and pork production poses a problem (although beef production is directly linked to dairy production and therefore likely to be constrained by dairy quota). Danish research points to dairy and beef production increases, but there are no quotas imposed. Direct payments shift the composition of final production. The Brussels-based CEP5 concludes that dairy and sugar face adjustment problems, and that direct payments actually hamper the restructuring of CEEC agriculture. Weber concludes that even with quotas increased CEEC sugar, milk and dairy production causes problems for an enlarged EU, and that direct payments, set-asides and quotas distort production. There are large gains to producers from accession, although, as the funding is largely EU taxpayer-based and not in consumer costs, consumer are not that much worse off. Saunders projects (a) an increase in Polish dairy production (without quotas) which takes the volume back to the 1990 level, and (b) in arable crops little change in Poland but an increase in production coupled with a decrease in consumption leading to increased exports of coarse grains from Hungary.

Estimates of the **budgetary cost** to the EU depend crucially on direct payments, with these representing around half of the total CAP transfer that could be in the region of twenty billion Euros from a potential 48 billion total budget. Even without direct payments, accession will redirect the payments from the current poor four² net recipients to the east. This is likely to accentuate the pressure for CAP reform that was not undertaken in Agenda 2000 - including degressivity. For Poland in particular, the high exemption level of grain production before set-asides operate means that this control mechanism will not be available to curtail pressures on exports and export subsidy constraints.

Depending upon the outcome of the quota allocations for dairy in particular, the **implications for New Zealand** do not seem to be as serious as previously thought. Beef production is strongly linked to dairy, the sheep herd has been decimated, and quality problems in specialist areas such as apple production discount potential competition in the short to medium terms. Beef into Hungary and possibly some fish exports to Poland seem to be the main potential threats to current direct exports to these countries. The silver lining in the cloud is that accession, by highlighting problems of the export subsidy constraints, direct payment levels and dairy quota allocations and administration, may be a useful impetus to further reform of the CAP.

² Ireland, Spain, Portugal and Greece

1. INTRODUCTION

Since the Berlin Wall fell the momentum towards integration of Europe has continued. Formalisation of this moved a step in 1997 when the EU Commission agreed to open negotiations with the five first-tier countries of Poland, Hungary, the Czech Republic, Slovenia and Estonia (the CEEC-5), and formal negotiations began in March 1998. Although official statements from both sides have until recently identified 2002 as the target date for accession, most observers consider this is increasingly unlikely. A timetable of 2005/2006 would appear to be more realistic.

Adding all ten CEECs (CEEC-10) to the EU-15 would represent a population increase of about 28 percent, with 60 percent of this coming from the five first-tier countries. In terms of GDP size the picture is different, as CEEC-10 would only add four percent to the EU when their economies are measured at current market and exchange rates, although this doubles when exchange rates are adjusted for purchasing power parity (PPP). This picture needs to be put into perspective, as two of the first-tier economies (the Czech Republic and Slovenia) have a PPP GDP very close to that of Greece. In fact, to put the GDP differences in perspective, Hungary in 1998 had a GDP just over 50 percent of the EU average (based on World Bank data), a figure very similar to Portugal's relative position with the richer EU members in 1980 prior to its accession. Thus, the concept of a relatively poor nation joining the EU has precedents, and indeed German unification attests to this. However, the real issue for the aspirants is the numbers of countries presenting their application credentials most of which are not as wealthy as Hungary.

In general, agriculture is much more important to the CEEC economies than it is to the EU, and, after a decline of roughly a quarter during the immediate transition years, agricultural output is starting to increase again. Potentially, expansion could increase the arable land base of the EU-15 by about 50 percent - with half of this coming from the five front-tier aspirants. Livestock levels are relatively lower, with dairy cows at 25 percent, sheep/goats at 17 percent and beef cattle 20 percent of EU numbers, with lower productivity accentuating the difference. There are several structural problems in the agricultural sector despite impressive progress during transition; these include an ageing population, poor infrastructure, generally fragmented land ownership patterns and low productivity. The agricultural sectors are, in general, not heavily supported, although many of these countries are aligning both their agricultural and trade policies with the EU as a precursor to accession. Most, excepting Hungary and Bulgaria, are net food importers, with the EU the dominant trading partner (Cochrane, 2000).

Concentrating on the CEEC-5, it is clear that both parties to the negotiations are well aware of the costs and benefits of accession. A major sticking point in these negotiations will be the issue of the Common Agricultural Policy (CAP); ie, a large CAP including EU

direct (compensatory) payments or a different CAP excluding these direct payments, thus setting up a two-tier structure between the incumbents and the new entrants. Extending the current CAP to the aspirants is even more likely to become the lever to force EU-wide changes to agricultural policy than WTO negotiations. Certainly the recent Agenda 2000 changes will not be sufficient to incorporate the five first-tier countries without modification, the adoption of two CAPs (the small CAP) or budget increases. There are, in essence, four parts of the cost/benefit analysis of EU enlargement: (1) the costs and (2) the benefits to the EU-15, and (3) the costs and (4) the benefits to the aspirants. Given that agriculture is both the largest component of the EU budget and a sector of direct importance to New Zealand, this study will concentrate upon the agricultural sector. Emphasis will be on the EU budgetary costs, the associated implications and the potential benefits and therefore possible displacement costs to New Zealand with respect to agriculture in the aspirant countries.

For any country to join the EU, it must meet the following criteria¹:

- develop stable institutions to guarantee democracy, rule of law, and respect for human life;
- develop an efficient market economy capable of competing in an integrated market; and
- demonstrate the ability to meet obligations of EU membership, including implementation of political, economic and monetary goals (eg., the full range of the EU CAP and alignment of monetary policies with those of the EU) (ERS, 1999)

The five first-tier countries have met the first criterion and have made substantial progress towards meeting the second. However, the third is more problematic, and an examination of their progress here is really a major component of this study. In general, both countries can be thought of as being in a pre accession phase of their development, with Hungary further along the road than Poland. However, both economies have considerable work to do in agricultural and rural policies before accession can become a reality.

¹ As agreed at Copenhagen during June 1993, and cited in *Agriculture in Poland and Hungary: Preparing for EU Accession*, Agricultural Outlook/December 1999, Economic Research Service/USDA.

2. POLAND

2.1 The Agricultural Sector

Agriculture is a vital sector of the economy in providing employment, in its contribution to the national income and export earnings. However, a major issue is that Poland's farms are generally small. The European Commission (1998) shows there to be 2.04 million farmers in Poland in 1996, with an average size of about 7.9 hectares, an improvement from the 2.17 million farmers and an average size of 7.0 hectares on 1988. Of these farms, 55 percent were between one and five hectares, with another 26 percent between five and ten hectares and these two categories own 46 percent of the land. Only four percent of the farms (but 24 percent of the land) are greater than twenty hectares². This small scale structure makes rationalisation and efficiency gains difficult, although an unofficial projection has been made that, based on changes during the early to mid 1990s, by 2005 just over half of the land might be farmed by holdings of over fifteen hectares.

Accentuating the small size problem is the fragmentation of plots, with nearly half of the farms owning non-contiguous plots. This problem will increase as size increases. Private ownership is and has been the dominant feature of land in Poland, with only some 20 percent of the land state-owned in 1990. Since then the land operated by the state sector has reduced to around 7.5 percent in 1996, but a problem of accumulated debt and unresolved ownership on some of the remaining state owned (but not necessarily operated, land) remains. Foreign purchase of farmland exceeding one hectare is restricted, as a permit is required from the Ministry of Agriculture and Rural Development. In July 1999 Poland requested an 18 year transitional waiver to maintain such restrictions following accession.

The detailed breakdown of production, profits and productivity on these largely small farms is interesting. With all figures in Euros (or ECUs), the average 1996 Polish farm income was 2,506 compared to 17,414 in the EU-15. Excluding subsidies these data change to 2,479 and 9,018, while (unsubsidised) farm income per hectare was slightly higher in Poland at 285 versus 281. Some 45 percent of the Polish production is used for family consumption versus only seven percent in the EU. Labour productivity is low in Poland, with output per annual work unit being only 15 percent of that in the EU.

Thus, agriculture has many aspects of a self-sufficiency system. The rural nature of Poland is emphasised by there being less than ten percent of the population residing in the three major cities. The majority of Poland's people live and work in a network of villages interspersed with small towns. Agriculture provides employment for a very high 26 percent of the Polish people, with correspondingly low levels in the service sector (within

² Note however that these data are similar to parts of the EU. These figures compare favorably with Italy, Greece and Portugal, and are similar to Spain.

the EU, only Greece, at 20 percent of employment in the agricultural sector, comes close to this figure). Unemployment and disguised unemployment is also very high in the rural areas.

Agricultural trade comprised 13 percent of Polish exports and 9 percent of imports in 1997, although the official trade balance is in deficit. The main trading partner is the EU, taking 58 percent of Polish exports and providing 57 percent of Poland's global imports, and holding a 45 percent market share in both agricultural exports and imports. For exports, live animals (6.4 percent), meat and meat products (16.4 percent) and milk and milk products (9.7 percent) were significant, and livestock products comprised one third of the agricultural exports. Almost all of the live animals went to the EU, while for meat and dairy products the market share between the EU and the former Soviet Union was about evenly split. Fruit products (12.5 percent) are important in the agricultural exports, with most of this destined for the EU. For imports, processed foods (22.2 percent), cereals (18.5 percent) and coffee (11.6 percent) are the main trade items, with most of the first two coming from the EU. Unofficial trade on both the German and eastern borders is high, and some estimates suggest that it may be as much as half of the official trade. This trade is in tobacco, meat and meat products.

In June 1994 a system of countervailing charges modelled on the old EU variable import levies was introduced. These charges are paid by food importers at the border, and operate like specific tariffs. Eight product groups are affected, including milk and condensed or sweetened cream, pork and poultry. In 1995 the simple average MFN tariff at the Polish border for imports of agricultural and food products was increased from 19.7 percent to 23.6 percent, well above the industrial rate of 8 percent at the time. During 1999 Polish border tariffs were again raised on many products.

The introduction of these protectionist measures and other instruments, such as guaranteed prices and sugar quotas, illustrate the problem facing policy makers in Poland in this instance but one facing officials and politicians in other CEEC countries too. While espousing free trade and open markets, the strong farm lobbies have forced governments to introduce a measure of protection that bears a close resemblance to the Common Agriculture Policy of the EU. Poland cites the impact of subsidised EU production and exports as a major causal factor in this policy change.

Nearly half of the total area of Poland is arable agricultural land, although a much smaller percentage of that is considered to be top quality land (medium soils occupy 61 percent of the total area of Poland). Cereals are by far the most important crops with wheat and rye predominant. Next, in order of area, are potatoes, fodder crops, sugar beet, oilseeds and pulses. The country is self-sufficient in most of these, but has an exportable surplus of beet sugar. Fruit and vegetables are important, and there is an export of fruit and fruit products.

2.2 The Livestock Sector

Livestock numbers and production has been badly affected by the economic transformation of Poland through falling consumer incomes, the elimination of production subsidies and the consequences for feed input and livestock output prices, and the credit problems in general over the period. The decline in numbers has been dramatic, although that decline has been arrested since 1994. Sheep numbers in particular have been decimated to just over ten percent of their levels at 1989, while cattle are about seventy percent of their earlier numbers.

The structure of cow herds in Poland is important to understanding the **dairy** sector. Some 25 percent of the milk is produced by almost one million farmers milking between one and three cows, while another 50 percent is in the three to nine cow units. Only 2.4 percent of the cow numbers are held in herds of more than twenty cows. This is reflected in the delivery ratio, which is only 53 percent nationally and as low as 30 percent in some regions, and has major implications for technological change, processing facilities and sanitary standards in the industry. This was emphasised with the January 2000 introduction of new milk-quality standards that will eliminate third-grade milk from the market. Since only milk that meets EU standards will now be able to be processed this will both decrease the volume of commercial milk and raise the standards (in October 1997 about 69 percent of Polish processed milk was from plants meeting EU first grade standards).

The average yield per cow is around 3,500 kgs of milk annually, lower than the 5,500 kgs in the EU and but the same as New Zealand's 3,452kgs. Consumption per capita declined through the early 1990s but has stabilised (this is especially so for butter). The FAO reports that Polish production for 1999 was up by six percent over that of 1998 (FAO, 2000). Exports have become significant in recent years, with the self-sufficiency ratio at around 106 percent (New Zealand exports around 90 percent of production, or a self-sufficiency ratio close to 1000 percent). Dairy cattle numbers declined from 4.99 million in 1989 to 3.5 million in 1998.

Nearly all **beef** in Poland is a by-product of the dairy industry, with about 85 percent of these being Friesian breeds that are often crossed with beef sires. The specialist beef herd is small in comparison with the 500,000 beef/dairy cow crosses each year. Domestic beef consumption fell from 17.2 kgs per capita to 10.0 kgs in 1995 before stabilising and increasing. The main exports are in the form of live cattle to Italy. There is a lot of effort being made to improve the breeding of the herds, although again the small size of the herds makes this difficult. This structural change may have major implications for the sector. The FAO predicts a continuation of the decline in Polish beef production; from 430,000 tonnes in 1998 to 350,000 in 2000 (FAO, 2000).

The **sheep** population in 1996 was only 551,600 head, 13 percent of the 1988 figure. The big flocks on the state-owned farms disappeared with the break-up of those units. This massive reduction in stock was caused by the lack of a stable domestic market for meat

and a big fall in demand. Per capita consumption is very low, and most of the domestic production is exported live to the Middle East or the EU. Although there are projections for a gradual recovery in sheep numbers, these numbers are only about 1 percent of the New Zealand flock. Goat numbers are even less, at around one third of the sheep numbers

2.3 The Processing Sector

The food processing industry accounted for 6 percent of GDP in 1996, and, with large enterprises above 50 people employing 75 percent of the total workforce, reasonably concentrated. Most of the sector is in private hands, but productivity is low (but improving) by EU standards in spite of recent investment. A particular problem is the slaughterhouses, most of which were established before 1935 and are situated in the centre of towns. Problems in the sector are accentuated by the very small scale of a lot of the farms, as it becomes difficult to source standardised raw materials of high quality, and this, in turn, impacts on the marketing of Polish products.

Market mechanisms were introduced to agriculture very early and comprehensively in the Polish transformation process. Previous communist governments kept farm prices down and subsidised sales to the consumer. When subsidies were removed prices rose, while at the same time incomes fell and better quality western goods took a large share of the market. Under decades of Soviet domination trade patterns were established with the USSR and COMECON countries. These markets have shrunk or disappeared and new trade with Western Europe has yet to make up the gap. These factors, combined with hyperinflation, were initially traumatic to the sector, as the decline in sectors such as the sheep industry clearly show. Poland has been asked to change from a state controlled peasant system to world-best standards in less than a generation. It is a big challenge.

2.4 Agricultural Policies

Table 1 shows the relative protection levels for Polish agriculture, with emphasis on the dairy and red meat sectors. Agriculture was heavily supported under the old system, although such comparisons with a market system are not really relevant. From the transformation these levels declined dramatically, but since that time the overall picture has been one of increasing protection levels. The most recent PSE estimate of 25 percent is below the overall OECD average of 40 percent, but above the US and possibly increasing towards the EU's level, which has increased from 38 to 49 percent over the two recent years. Livestock products are also shown, and it can be seen that they are lower than the overall average, with beef actually being taxed. Support to milk has doubled in the past year, although it is still a long way from the EU PSE level of 58³. Not shown is that cereals,

3

Footnote Table: OECD estimates of the EU PSE data Percentage			
	1991-93	1997p	1998p

sugar and sugar beet, pigs and poultry are above the Polish All Agricultural average, but below the comparative EU levels. The 1991 to 1993 period was an abnormality when the impact of currency devaluations temporarily overwhelmed market price transfers and other support mechanisms. In 1999 more than 80 percent of the total supports were in the form of market price supports.

a) Table 1: Polish Support to Agriculture Expressed as a PSE

	1986-88	1991-93	1997	1998	1999p
All Agriculture	29	12	22	23	25
Milk	15	-3	18	21	9
Beef and Veal	32	-8	10	1	-2
Sheepmeat	25	-5	13	13	3

Source: OECD

For 1997 cereal producer prices in Poland were very close to EU prices, with wheat actually above the EU. Sugar beet prices are just above half (posing complications for the EU), while fruit and vegetable prices are even lower. Apples, for example, were only 12 percent of the EU price. Beef prices were just over half, sheepmeat 75 percent and the all-import cows milk 51 percent of the EU price, although for high-quality milk the price is nearer to the EU's. During 1999 Poland increased the administered price for milk but decreased the prices for wheat and rye.

Poland utilises the standard suite of policy support measures but most of the direct support is in the form of input subsidies. Poland is well within its AMS WTO obligations, however. During 1999 tariffs were raised on several import items and the use of export subsidies for sugar continued. Export subsidies were used for the first time for both non-fat dried milk and starch (although the meat export subsidies have not been used). Several products of interest to New Zealand such as beef, sheepmeat and dairy products all have import tariff quotas, although in most cases the allowed in-quota import amounts are rising. The tendency is to align agricultural institutions and instruments with EU policies as a preliminary step towards integration. This places pressure on consumers as food prices increase.

Total support to the agricultural sector (the TSE) in OECD countries is measured by adding together the support to producers, the support for general services and consumer subsidies. This total can then be expressed as a percentage of GDP, and is an interesting

Milk	57	50	57
Beef	54	55	62
Sheepmeat	71	64	65
All Agriculture	47	38	45

way of viewing agricultural support as it puts into perspective the ability to pay for these supports. The OECD average share of TSE in GDP has remained largely unchanged at about 1.4 percent since 1996, after having declined gradually from 2.3 percent since 1986-88. Turkey heads the OECD list with a TSE/GDP ratio of around 8 percent of GDP. This followed by Korea at 5 percent and then Poland at around 2.6 percent. Hungary is ahead of the EU, Japan and certainly the US, with a ratio around 1.8 percent, while New Zealand has a figure that hardly registers. The policy implication is that agricultural supports in both Poland and Hungary are relatively expensive, while the large supports to the mature economies of the EU, Japan, the US and Canada are fiscally manageable given a political will to keep them.

An examination of **Polish exports to the EU** shows that currently only in WMP does Poland have exports to the EU which may be a threat to New Zealand in the medium term. However, the EU-15 in total only ranks as New Zealand's 28th export destination for WMP, although 26 percent of Polish exports are destined for the EU. Almost all of the Polish sheepmeats are exported to the EU, but the values are insignificant, while about \$15 million in beef exports are exported to the EU. Almost all of the Polish honey exports go to the EU, but again the value is small. With apples nearly one million dollars worth or six percent of Polish exports are sent to the EU. This represents only 0.3 percent of the EU market, whereas New Zealand has a 28 percent share. However, in apple juices Poland has a dominant 55 percent share of the EU market, highlighting the product quality problem with eating apples.

As discussed above, the threat from dairy is directly linked with two features of the sector. The first is the small and fragmented nature of production, along with the quality problem associated with much the output, while the second is the unresolved issue of quota allocation upon accession and the more medium to longer term future of that quota regime within the expanded EU. The sheep sector was decimated over the 1990s, and there is no sign of it returning even to the modest levels of the past, while beef output is largely a function of dairy quota given the joint-product nature of the dairy sector. Apples must be considered a threat over the longer term, but quality problems and the seasonal nature of the crop suggest that technology regarding quality improvements and long-term storage facilities are such that the threat is a considerable way into the future.

3. HUNGARY

3.1 The Agricultural Sector

Hungary is blessed with fertile plains, a good climate and an abundance of water, all features conducive to agriculture. Around two-thirds of Hungary is agricultural land, with about three-quarters of this classified as arable land and a further 12 percent in permanent grassland. There are however problems of salinity and water pollution in many areas detracting somewhat from this rosy picture.

As with Poland, agriculture and its related services are a vital sector of the economy in providing employment, in its contribution to the national income and in export earnings. In 1996, agriculture and forestry accounted for some 6.6 percent of GDP, down substantially from 15.6 in 1989, and employed 8.2 percent of the workforce, also down from a stable 20 to 21 percent through the 1980s. The food industry contributes another 3.8 percent of GDP and 3.5 percent of employment. However, a difference is that, while Poland's farms are generally small, Hungary does have more large scale production units. Prior to the reforms of the 1990s the 120 large state-owned farms and 1200 cooperatives co-existed with around 1.4 million individual small plots, with the latter representing only 6 percent of the land area but 35 percent of farm output. While the land market does not function very well, there is a transition to private operation through leasehold and private ownership emerging, with most of the land now in private hands. The European Commission reports that while there were over two million farmers in Hungary in 1996, some 50 percent of the land is farmed by about 4,000 operations and there are now estimated to be a middle-ground of between 30,000 and 40,000 full-time private commercial farmers, although only a few farm more than ten hectares. In general, this larger scale structure should make efficiency gains easier to achieve.

Hungary is less rural than Poland, with only some 37 percent of the population classified as rural. There still is, however, a disparity between urban and rural GDP per capita figures. Although overall the Hungarian average is only 37 percent of the EU average, the 20 percent of the Hungarian population living in Budapest have a GDP figure of more than double the Hungarian average (or about 80 percent of the EU average). In order for these conditions to hold the rest of (mainly rural) Hungary must have a significantly lower per capita GDP. However, agriculture has aspects of an employment buffer in the economy, with city dwellers, and especially older people, leaving the towns after receiving a small rural plot of land. A pointer to this dual farm structure problem is the increasing activity in an informal agriculture and processed food market among the poor in Hungary.

Cereals are again by far the most important crops, with wheat and maize predominant, accounting for 85 percent of cereal production and 90 percent of cereal exports. Sunflowers and sugar are also important, and vineyards, fruit and vegetables all

contribute. Livestock numbers and production have been impacted by the economic transformation of Hungary, with both sheep and cattle numbers in 1996 little more than half their 1990 levels. The food-processing sector has been largely privatised, with around half of the sector now foreign owned. This has resulted in new processing and marketing technologies to the extent that the wider agro-processing sector has considerably improved the competitive position of Hungary; labour productivity increased by 29 percent from 1992 to 1995 in the food industry and more than doubled in agriculture over the same period. The labour productivity levels in agriculture are much ahead of Poland's, just above the EU-15 average and considerably above some of the current EU member states. This is a direct result of the 1990s labour shedding in the agricultural sector.

Producer prices are generally lower than EU prices. By 1997 most of the arable crop prices had moved up to near EU levels (barley 95 percent, sunflowers 98 percent), although maize was only 55 percent. Hungarian meat prices varying from beef at 54 percent to pigmeat 83 percent, extra or first-class milk prices were 72 percent of the EU level, and fruit and vegetable prices languish (apples 22 percent). Sugar prices, although only 54 percent of the EU level are still about double the world price, while wine is supported through tariffs and export subsidies. During 1999 Hungary increased its administrative prices for milk and beef while reducing those for maize and pigmeat. A new premium for quality milk was also introduced.

With a full CAP accession there would be little price difference for cereals except maize, and pig and poultry meats. The gap for cereals and dairy produce would close further while the beef gap would close significantly. Sugar prices would rise, but output would (most likely) be restricted by production quota. For fruit and vegetables the problems are structural rather than simply price.

Hungary is traditionally an exporter of agricultural produce, and these accounted for about one quarter of total exports immediately after the transition began, although that share has slipped even though the nominal value of these exports has stayed up. Agri-food exports in 1997 were about 2.3 billion ECUs, with meat (beef and poultry), processed fruit and vegetables, cereals and wine the most important items. The EU is the destination for about half of this trade, and most of the rest is to non-EU European economies.

3.2 The Livestock Sector

There has been a dramatic decline in livestock numbers and production in Hungary. This resulted from an abolition of the meat consumption subsidies, a drop in real living standards, the collapse of the old Russian markets, droughts in 1995 and 1993, a lack of capital and the breaking of the symbiotic linkages between large-scale farms and small plots. Livestock numbers halved over the 1990s, while the value of livestock production decreased by over one third and has yet to stabilise. The value of the cereal crops decreased by a much lesser 17 percent, suggesting that Hungary's competitive advantage lies in cereals and not livestock production.

In contrast to Poland, and following from the farm structure, some 75 percent of the milk is produced on large farms under intensive indoor concentrated feed-stuff production systems. The yield per cow fluctuates around 5t/cow, and is close to the EU average and greater than New Zealand's. In recent years the **dairy** cow numbers have dropped by around 30 percent to 400,000 head, with milk production mirroring that change.

Until the beginning of the 1990s Hungary was an exporter of dairy produce, with cheese exports reaching 23,000 tonnes in 1990 or one quarter of the production. Since then the situation has deteriorated, and cheese exports are now only half of that figure while butter is slightly below self-sufficiency levels. Overall, the sector, at 101 percent, is just on the self-sufficient level. The domestic market is changing rapidly, with strong foreign investment and increased market promotion and competition, although domestic consumption has slumped by a quarter in recent years. Quotas were introduced in 1996. Hungary has requested EU milk quotas of 2,800,000 tonnes upon accession, a figure about exactly at the 1990 production level (560,000 cows producing 5.082 tonnes per cow) and about 800,000 tonnes or about one third above current production. Milk prices were 72 percent of the EU level in 1997, and are projected to rise slowly as demand for higher quality produce increases.

As in the case of Poland, nearly all **beef** in Hungary is a by-product of the dairy industry, and the herd has declined by almost a half since the early 1990s. Producer prices are only 54 percent of the EU producer price in 1997. Domestic meat consumption of between 7-8 kg/person is low, and makes up around 10 percent of total meat consumption - pork and poultry are the main meats. That consumption level has been fairly constant over recent years, and exports have decreased. There is still an export trade in live animals, mostly to the former Yugoslavia and Italy, but imports and exports of beef are about in balance. As with Poland, the FAO predicts a decline in beef production; from 65,000 tonnes in 1998 to 61,000 in 2000.

The total **sheep** population in 1996 was only just over one million head, with ewe numbers at 741,000. Both figures are slightly under half of the 1989 figure. Production is based on extensive grassland farming, somewhat similar to the New Zealand system. Per capita consumption of sheepmeat is extremely low, and most of the domestic production is exported live to the EU (mainly Italy). There are projections for a gradual recovery in sheep numbers, but these numbers are currently only 1.5 percent of the New Zealand flock.

3.3 Agricultural Policies

Table 2 shows the relative protection levels for Hungarian agriculture, with emphasis on the dairy and red meat sectors. Agriculture was heavily supported under the old system, although such comparisons with a market system are not really relevant. After the transformation these levels declined dramatically, but since that time the overall picture has been one of increasing protection levels in the most recent period due to increased market price support. The 1999 PSE estimate of 20 percent is below the overall OECD

average of 40 percent, but above the US and possibly increasing towards the EU's level, a level that has increased from 38 to 49 percent in the two most recent years. However, Hungary (and Poland's) levels are very high for a country at a middle stage of development. About fifty percent of the supports are provided through market price supports.

It can be seen that red meat protection levels are lower than the overall average, but support to milk remains high and close to the EU level of 58 shown earlier in a footnote. Not shown is the huge variation in many of the crop sector PSE's; for example, over the two most recent years wheat has gone from -10 to 8, maize from -32 to -10 and oilseeds from 1 to 29. Sugar and poultry are heavily supported, while pigmeats are consistently around zero. The producer support per hectare in Hungary was \$US95, well below the OECD average of \$US211, Poland's \$US198 and the EU's \$US801, but much more than New Zealand's \$US5 and Australia's \$US3. Border protection for items of interest to New Zealand are high; beef from 40 to 112 percent, butter 159 percent and sheepmeats 40 percent.

a) Table 2: Hungarian Support to Agriculture Percentage pse					
	1986-88	1991-93	1997	1998	1999p
All Agriculture	39	16	7	13	20
Milk	45	37	41	53	50
Beef and Veal	69	39	12	11	5
Sheepmeat	39	15	-1	17	5

Source: OECD

Until January 1998 Hungary was a member of the Cairns Group, and adopted a reasonably liberal approach to agricultural trade policy, reflecting its status as a major exporter. Since leaving the Group, however, the emphasis has changed to one of aligning the policies with the EU to pave the way for accession. Market price support is the main mechanism for delivering support, with a system based on guaranteed and guidance prices. Export subsidies are used for a range of products, and imports are regulated by tariffs and import quota regimes. Export subsidies have followed a controversial path in Hungary, as the Hungarians made the tactical error of setting their WTO schedule levels in (an inflationary) local currency, not US dollars, and omitted trade with the former COMECON countries. A dispute followed, with New Zealand one of the WTO complainants. A compromise waiver agreement was reached that holds until 2002⁴. An examination of the data shows that, while export subsidies were used to the maximum in 1998 for corn and red pepper meal and moderately for pig and poultry meats, they do not play a major part in supporting producer prices, WTO (2000). Importantly, Hungary will

⁴ Export subsidies in both 1995 and 1996 were about double the level of Hungary's commitment of FT 22 billion in nominal terms and covered 149 products instead of the required 16 specified in the WTO Schedule. The dispute resulted in a waiver for Hungary until 31 December 2001, with the new base amount of FR 51 billion reducing to 42 billion in 1997 and 22 billion by 1 January 2001. WTO (1998).

have little in the way of export subsidy rights to bring into an enlarged EU, placing further pressure on the current members. In addition, there are serious questions being raised domestically over the efficiency of the Hungarian export subsidy programmes; for example, why was it necessary to provide \$US40 million in wheat export subsidies in 1995 during a major international wheat price boom? Most of the agricultural products of interest to New Zealand exporters (again, beef, sheepmeat and dairy) have quotas, although the in-quota amounts are generally rising.

Over the next few years the European Commission expects meat production and utilisation to steadily increase, but back to a level of only 75 percent of that pre-transition (EU Commission, 1998). The largest increases within the meat sectors are expected in the pigmeat production and consumption. In other agricultural sectors there will be an overall increase in production, although the increase in sugar productivity may not quite make up for the reduction in area. Milk production will most likely increase to 2.4 million tonnes, still below the pre-transition level of 2.8 million tonnes. Similarly, beef production will increase commensurably with milk quotas, but not back to a level which allows for exportable surpluses of beef. Milk production is likely to be one of the most vexing issues for negotiation between the EU and Hungary, as naturally Hungary will want to push the milk quotas to the highest level possible while the EU is facing problems of over-supply with current members.

The World Bank tracked through the likely implications of Hungary adopting increased CAP prices (Debatisse, 1998). They consider this will lead to increased cereal production, but less domestic livestock consumption of these cereals as the competitive position of pig and poultry producers weakens. The net result will be increased intervention stock of cereals, and wheat in particular, in Hungary and France needing export subsidies to market internationally. Accentuating Hungary's problems are the poorly defined link between the farmer and market institutions, in contrast to the EU-15 where intervention is largely directed at the wholesale level and then flows smoothly to farmers thanks to efficient linkages.

Sugar and milk quota allocations are a vexatious issue, as they have the potential to impede the restructuring underway in these two sectors. There are two aspects of quotas; equity and efficiency. Equity relates to who gets the quota and how much, and given the rapidly evolving nature of these sectors this will be problematical. Efficiency is guaranteed if, and only if, the quotas are freely tradeable after the initial allocation. This will also be contentious, and highlights the need for an improved agricultural infrastructure. These infrastructure constraints include the inefficient and costly transportation network in Hungary, a land-locked country with visions of becoming a grain exporter. In the broader sense, the definition of infrastructure could be expanded to include the poorly functioning land market and the complex and often under-developed credit market.

An examination of the **Hungarian trade** data shows (a) that there are few trade items from Hungary to the EU that potentially impact upon New Zealand interests and (b) that these

agricultural trade lines are not large trade items. The largest is wheat, at \$US51.3 million or just over NZ\$100 million. Most of the current (1996) duties and the final UR bound rates are at a level that could be described as medium in the context of some of the EU agricultural duties. Several of the Hungarian exports are in products that are subject to import quotas into the EU - live sheep, cherries, wheat, maize and sausage meats. Accession would give Hungary an advantage in these items. However, none can be considered to be threats to New Zealand interests with the possible exception of apple juice.

4. TOWARDS ACCESSION: ISSUES FOR POLAND AND HUNGARY

With or without accession there is an urgent need for Poland to increase the efficiency of its whole agricultural system. For Poland to become internationally competitive it must modernise with improved technologies, restructuring the farming and food processing sectors with better linkages to the market. An integral part of this is the need to improve quality standards. The importance of a demand-driven approach rather than the decades-old supply driven approach is crucial, but an associated problem with modernisation and structural change is that this inevitably leads to lower employment, a problem accentuated by the importance of agriculture as a provider of employment. Given the small scale and fragmented nature of land holdings, this whole agricultural adjustment process will not be easy for Poland, notwithstanding the impressive results of the last decade. However, part of the labour shedding will come about through the ageing of the agricultural population, as many of the (eventually) retiring persons will not be replaced. The nature of the agricultural workforce and its associated low productivity is highlighted by the differences between those in agriculture directly and those employed in the support services. While in the EU there is typically between two and three people employed in agricultural services for every person employed directly, in Poland the ratio is at least reversed and may even be higher the other way around.

For Hungary the broader issues are more subtle, as the country has been a traditional exporter of agricultural products and is striving to increase its competitive position. The farm structures are larger and more efficient and the agri-food sector has undergone considerable transformation, much of which has been funded by international capital. The dilemma is that accession will lock Hungary into the EU system. A balance exists between the potentially large transfers from the EU coffers and access to fortress markets on the one hand and lost export potential at world market prices on the other. Hungary's best hope may be to accede to the EU and rely upon liberalisation for the longer term. In this respect its Previous Cairns Group credentials will be valuable.

The big question facing the EU is the issue of compensatory payments to the new entrants. The Commission has argued that they should not be extended to new entrants, on the grounds that these payments were introduced to compensate EU farmers for the price reductions introduced in the 1992 McSharry reforms. However, that argument has been undercut somewhat, as since the Agenda 2000 reforms these payments have been portrayed as direct payments⁵. If the payments are not compensation for earlier price cuts,

⁵ The Hungarian Government considers that its farmers should be entitled to these payments. It should be noted that in the case of arable crops the term compensatory payments used in Council Regulation (EEC) No 1765/92 has been replaced by the term area payments. Also, Article 24(2) of the Treaty provides that the common organisation shall exclude any discrimination between producers or consumers within the Community.

then why should the new entrants be denied them? It seems incompatible with a single market that some would be paid and not others, and, importantly, the current criticism of CAP payments that a disproportionate amount goes to rich farmers rather than poorer ones would be accentuated if the rich west and not the poorer east received direct payments. Nor is the argument tenable, as GDP is lower in the east than the current EU members, direct payments would skew farmer incomes relative to the rest of the population in any particular country. The richer aspirants have a GDP close to the poorer countries currently in the EU. This single issue is likely to place enormous pressure on the negotiations and, depending on the outcome, the CAP itself.

The 1992 CAP reform changed the way in which EU cereal, oilseed, protein crops, and potatoes, were supported. This combined price support and compensation payments, with the compensation payments to replace reduced levels of price support. The objective was to reduce price supports to the world price level, but to maintain incomes by the compensation payments. In theory, the EU would not be paying export subsidies on surplus production, as the crops were being paid for at the world price. These payments were made on a regional average yield basis, and there were also set-aside regimes, put in place to restrict production. But these set-asides only apply to farmers producing more than 92 tonnes of grains. Thus, given the small scale nature of farms in Poland in particular, the set-asides are unlikely to be effective, and as the EU has no definition of a farmer there is no lower qualifying limit.

Of direct interest to New Zealand are milk quotas. While there is mounting evidence that the EU would be able to become internationally competitive at (increased) world market prices for milk in the absence of quotas, the political reality is somewhat different. Under Agenda 2000 milk reform has been postponed until at least 2005, a year in which it is possible that the five first-tier may actually be members. This would mean firstly the establishment of quotas in these new entrants and then the almost immediate need to participate in negotiation to fundamentally reform the milk regime. This seems irrational, especially given that the EU is trying to argue against making compensatory payments to the aspirants. Finally, apart from all this, the fragmented farm structure and small scale of the herds in Poland, in particular, would make the establishment and the administration of milk quotas a technical nightmare. Reforming milk policies in an EU-20 or EU-21 can only be more complex than it currently is. While of less direct interest to New Zealand, a similar situation exists in the sugar sector, where accession is likely to be another factor exerting strong pressure for reform of the current EU regime.

Budgetary pressure is another consideration for the EU-15. The heads of state claimed that the Berlin summit on Agenda 2000 made the necessary changes for accession. Agenda 2000 estimated the cost of accession to be six to seven billion euros, but direct payments would add at least another eight billion ECUs annually to this. However, even this seems to be a conservative estimate, as it is based in part on the low current yields in the aspirant countries. By the time of accession these yields are likely to be higher, and there is a precedent enjoyed by Spain where base yields were considered to be too low because of unusual circumstances. This upward shifting of the base yields will increase the costs.

Considering these factors and including direct payments, the cost is likely to be in the vicinity of 20 to 21 billion ECUs annually, of which nearly a third would fall to Germany. In addition, the EU has made no provision for Cohesion Fund payments to the aspirants.

The adjustment required for integration into the EU will accentuate the dramatic changes which have taken place in the CEEC economies over the last decade, creating winners and losers in the process. Many of these may result from sequencing problems, which will be almost inevitable, and of course many of the winners and losers are already well down their respective paths. While the aspirants will benefit enormously in terms of security and stability, they are giving up part of their sovereignty and many of their domestic policy instruments. Agricultural has already seen dramatic changes, and integration will produce more. Both the sequencing of, and the derogations associated with, the integration process will be factors, and the unresolved questions of EU compensatory payments and quota allocation loom as crucial in determining whether agriculture is a large winner. Certainly consumers will be losers in most situations as food prices generally adjust towards EU levels. However, given the adjustment these economies were forced to make a decade ago as the Berlin Wall came down, this process will be familiar to those who lived through that deep crisis. Their adjustment is a spotlighted example for many other countries that are struggling to adjust to globalisation, albeit an extreme example. At least there will be considerable welfare transfers from the EU for an extended period to cushion the adjustment process.

5. ACCESSION AND THE WTO IMPLICATIONS FOR THE EU

As a generalisation agricultural prices in the EU are above world prices, while those in the aspirants are below the world price level. Even now, close to the end of the Uruguay Round implementation period, export subsidies are beginning to bite for the EU, although thanks to the Blue Box exemption the AMS disciplines are not. Unfortunately the Agenda 2000 reforms did little in a meaningful way to prepare the EU for either expansion or the next WTO round. In particular, the introduction of degressivity would have at least provided some signals that there was an intention to address the problems associated with the CAP. Complicating the CAP reform are the issues of a single EU currency and the recent livestock sector disease outbreaks. In the final analysis, accession means a common set of policies and border protection rates, with the aspirants adding their export subsidy and AMS entitlements to the incumbents' total. The impact on export subsidies of netting out is discussed later.

The World Bank reviewed the estimates of the overall costs associated with Poland's accession some three years ago (Debatisse, 1998). These costs are borne directly by three groups: EU taxpayers, Polish taxpayers and Polish consumers. They considered, based on relative prices at that time, that the EU budgetary cost of agricultural policies would be in the order of \$US3 to 5 billion annually, or between 5.5 and 9 percent of the 1997 EAGGF which funds the CAP, in line with Poland's 9.5 percent share of an EU-16 population. These transfers from the EU would represent about 5.5 to 6 percent of the Polish GNP per capita, with most being directed towards the Polish agricultural sector. This cost would seem bearable to the EU, but Poland is only one of the aspirants. Based on the 1998 OECD data, food prices to Polish consumers would increase by around 20 percent overall as a basket.

Two further studies that consider the reforms of the CAP will be insufficient for the EU to meet its existing WTO commitments on the volume of subsidised exports, unless there is a substantial increase in world prices (Brenton and Ferrer, 1999). The EU problems stem from the partial nature of the CAP reform, partial cuts in the difference between intervention and world prices, and the decoupled nature of EU policies, which has not resulted in reduced production of cereals in particular. On the other hand, introducing higher prices and market stability to the CEECs will increase production, exacerbating the EU export subsidy problems and limiting their scope for genuine concessions in the next WTO negotiations. Detailed analysis shows how, using 1997 exports, the EU-21 combined export subsidy volumes will be breached in the year 2000 by 30 percent in wheat, 69 percent in coarse grains, 15 percent in beef, 10 percent in SMP and 260 percent in sugar.

Agra Europe reports that the EU's capacity to export grain could be reduced by around ten percent with the first tranche of accessions (Agra Europe, 2000). This is because of the netting-out process, whereby the historic levels of trade between the EU and the aspirants

are deducted from established WTO subsidy limits. Accentuating this is the fact that the CEECs have only a small contribution of export subsidies in the grain sector to bring to the table, and exports to the EU will again need to be netted-out of this total. However, the timing of accession may alter this as current double-zero talks, whereby tariffs are reduced to zero in exchange for a waiver on export subsidies, potentially would alter the distribution of the remaining export subsidies of the respective parties. The same article also cites an EU grain industry spokesperson as forecasting an increase in the CEEC-10 grain surplus of 6.5mt, up from the current 2.3mt average⁶.

The WTO reveal the extent to which the EU has used the carry-over provisions in the most recent periods to enable it to continue exporting subsidised product (WTO, 2000). Currently the low value of the Euro helps the EU meet its value constraints, but there are pressures building on the volume constraints as world agricultural prices stay at low levels. During 1998, the latest recorded data, the EU exceeded its volume ceilings on coarse grains, sugar and pigmeat in the products of relevance to Poland and Hungary's accession. In the current 2000/01 year the use of carry-over is not permitted, and this will trigger cuts in export subsidies.

⁶ It is interesting that this figure is the same as the 4.2mt that is forecasted in increased grain production in the model simulation for this paper following the accession of Hungary and Poland alone.

6. ACCESSION MODELLING

The studies above were concerned with the broader aspects of enlargement. However the purpose of this paper is to identify the impacts of enlargement on New Zealand agriculture. To determine these, a more detailed modelling approach is required, as reviewed below.

Of the studies which have modelled the impacts of enlargement, few have explicitly included New Zealand. An exception to this is a study undertaken by the Danish Institute of Agricultural, Forestry and Fisheries Economies for MFAT which was based upon an aggregated modelling approach using GTAP. The results of this study clearly indicated that expansion would have a negative impact on New Zealand. Moreover the study concluded that this negative impact on New Zealand could be greater than for any other country or group in the absence of CAP compensatory payments (Jensen, 1999).

The Jensen study showed that enlargement to the new CEEC was estimated to decrease the per capita welfare in the EU-15 by 0.18 percent and the new members are estimated to gain by 4.7 percent. New Zealand is estimated to lose 0.10 percent (NZ\$100 million) in welfare terms, caused by a detrimental impact on world export prices for agricultural products leading to a terms of trade loss for New Zealand.

Enlargement leads to increased exports of dairy and bovine meat products from CEEC to both the EU-15 and non-member regions. This causes, firstly, EU imports of dairy and bovine meat products from non-member regions to decline and, secondly, competition from CEEC exports in third markets. As a result of these two factors New Zealand's total exports of dairy products reduces by 0.8 percent in price and 5.7 percent in volume.

Weber used the partial equilibrium model CEEC-ASIM to examine accession questions, and in particular the impacts of a CAP implementation on agricultural output, food demand and farm incomes in the accession countries and on the EU budget (Weber, 2000). The model covers 12 agricultural commodities, and EU accession under full application of the CAP (AG) is compared to a base run scenario of unchanged national agricultural policies (BA). For AG it is assumed that by 2007 the CEEC-10 will have fully implemented the CAP Agenda 2000, and the EU farm gate prices of cereals, sugar, beef and milk and price cuts of 15 percent for cereals and milk and 20 percent for beef are factored in. Area payments for cereals are given, production quotas on sugar and milk are implemented, the premium on beef is modelled and a milk premium is paid.

Implementing the CAP sees farm gate prices for wheat, potatoes, oilseeds, vegetables, pork, eggs and poultry fall, whereas for sugar, milk and beef prices increase. In addition, producers of cereals, oilseeds, beef and milk receive direct subsidies of area payments and livestock premiums. Output in many of the main sectors is restricted by the set aside requirement, leading to substitutions such as wheat by coarse grains and oilseeds; wheat output is reduced by 7 percent, whereas output of coarse grains and oilseeds fall

marginally. Sugar prices rise substantially, but production is lower because of quotas. In the livestock sector, the CAP's impacts on relative prices and milk quotas lead to significant adjustments. Output of pork and poultry fall, while for beef EU price support and premiums result in output rises of 27 percent, a rise that would be even higher if no milk quota existed given the linkage between beef and milk production.

Overall, price supports and direct subsidies increase real income from agricultural activity by 39 percent in the CEEC-10, with only Slovenia's farms worse off. The impact on demand is modest, with price increases for sugar, milk and beef balanced by price cuts for pork, poultry and eggs. The total impact on consumer welfare is small compared to the change in producer welfare due to the low value share of agricultural products in food retail prices and the re-orientation of the CAP from price support towards direct subsidies. In some countries consumers are even better off with the CAP; in Hungary price reductions for pork, poultry and eggs more than outweigh the price increases for the other commodities.

Halmi and Elekes used the ESIM model to examine the response generated from Hungarian accession. Milk appears to be restricted by quota, therefore there is no increase in either milk or beef production. The findings include increases in production and exports of cereals due to higher prices. There is also a predictable fall in pig and poultry production, with Hungary becoming a net importer of these products, due to the higher prices of cereals (Halmi and Elekes, 2000).

A study at Iowa State University found that EU enlargement with Poland, Hungary and the Czech Republic would provide a major shock to EU dairy markets, even with milk quotas (Fuller et al., 1999). In all three CEECs production increases to the extent allowed by quota, but consumption drops drastically for example by around 25 percent in Poland. Producers benefit, but at the expense of consumers. Exports to the current EU-15 increase in all dairy commodities by an order of magnitude between one and three times, despite inventory building. The impact on world prices is negligible, excepting for some trade diversion in the EU market. However, with the domestic producer price rise exports of Polish SMP decrease dramatically, increasing world prices slightly.

New Zealand exports are marginally impacted, with a general pattern of slight increases of up to 1 percent for SMP by 2005 followed by decreases in all dairy products by up to 0.4 percent in SMP by the year 2010. Cheese is a minor exception, as the early decline is not as great and the final picture represents an increase of 0.1 percent in exports to the world. The EU shows increased exports of butter (10 percent), cheese (16 percent) and SMP (61 percent), although it is not clear that export subsidy constraints are modelled. It appears that an assumption is made that as supports to dairy are direct payment there are no export subsidy constraints, which seems a tenuous at best assumption.

Saunders (2000) in a companion document to this paper used the Lincoln Trade and Environment Model (LTEM) to simulate the implications for New Zealand of the accession of Poland and Hungary. This model has an advantage over some of the more aggregated models in that it gives a broader sector breakdown of the dairy sector, the sector of most

interest to New Zealand. It is, however, acknowledged that in an increasingly complex productive sector this breakdown is still cursory. The reader is referred to Saunders (2000) for a more detailed discussion of the model. Dairy production was not constrained by quota.

For raw milk Saunders predicted an increase of 34 percent in Poland (to 15.53 million tonnes) and an 11 percent increase in Hungary (to 2.12 million tonnes). This Polish level is below the levels of 1989/1990, while the Hungarian level is below both historical levels and the EU quota requested by Hungary upon accession. Production in butter and cheese increased in both countries, but there was little change in the production of powders. Consumption declined in both countries in butter and cheese. The net result was a large surplus of butter and cheese in Poland and a small increase in the Hungarian surplus, sounding a warning for EU export subsidies. There was no change in New Zealand's production and only a very small change in the other main regions of the US, the EU and Australia.

The significant changes in the production of livestock with EU entry are a 109 and 31 percent increase in the output of beef and veal in Poland and Hungary and a 10 and 8 percent increase in output of pigmeat in Poland and Hungary. The consumption of beef and veal in Poland and Hungary decreases by around 60 percent. This results in a surplus of beef and veal in Hungary (this model does not constrain output via dairy quotas.) Pigmeat surpluses were also predicted to rise in both Poland and Hungary. Again, the trade impacts of Poland and Hungary joining EU on livestock is minimal for New Zealand and for most other countries in the model.

The results from the research by Saunders are consistent with other analysis discussed earlier in the paper where similar assumptions have been used. The Jensen study predicted an increase in dairy and beef production, as no quota was imposed upon dairy production. However, there was more of an impact upon world markets as all the surplus was assumed to be exported with no export constraints. Weber, even when using milk quotas, predicts an increase of 27 percent in CEEC beef production. Halmai and Elekes constrain milk by quota and therefore have limited increases in milk and beef production. Fuller, examining the dairy sector while using quotas, finds a similar large decline in domestic dairy consumption following the price increase in Poland. Brenton and Ferrer find that the new combined EU export subsidy regime would be breached by accession in wheat, coarse grains, beef, SMP and sugar, and by up to 69 percent in the case of coarse grains and 260 percent in the case of sugar.

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ANNEX

Table A1: World Dairy Production and Trade Data						
Milk	Production mt			Exports mt		
	94-98	1999	2005	94-98	1999	2005
World	522.7	550.3	599.3			
EU	120.7	121.2	120.8			
NZ	10.2	12.2	13.4			
Poland	12.1	12.6	13.7			
Hungary	2.0	2.1	2.4			
Butter						
EU	1860	1866	1812	205	193	183
NZ	326	402	412	268	330	340
Poland	163	170	184	8	4	3
Hungary	14	14	15	1	1	1
Cheese (kt)						
EU	6468	6770	7140	501	443	481
NZ	232	294	394	193	257	347
Poland	404	488	555	21	40	58
Hungary	54	58	62	11	17	20
SMP (kt)						
EU	1197	1173	966	243	263	178
NZ	196	220	187	191	212	179
Poland	122	123	130	100	115	120
Hungary	5	5	5	0	-1	-1
WMP (kt)						
EU	990	958	1077	540	441	527
NZ	357	460	527	356	459	526
Poland	39	39	41	5	4	5

Source: OECD Agricultural Outlook 2000 - 2005.