

Chapter 7

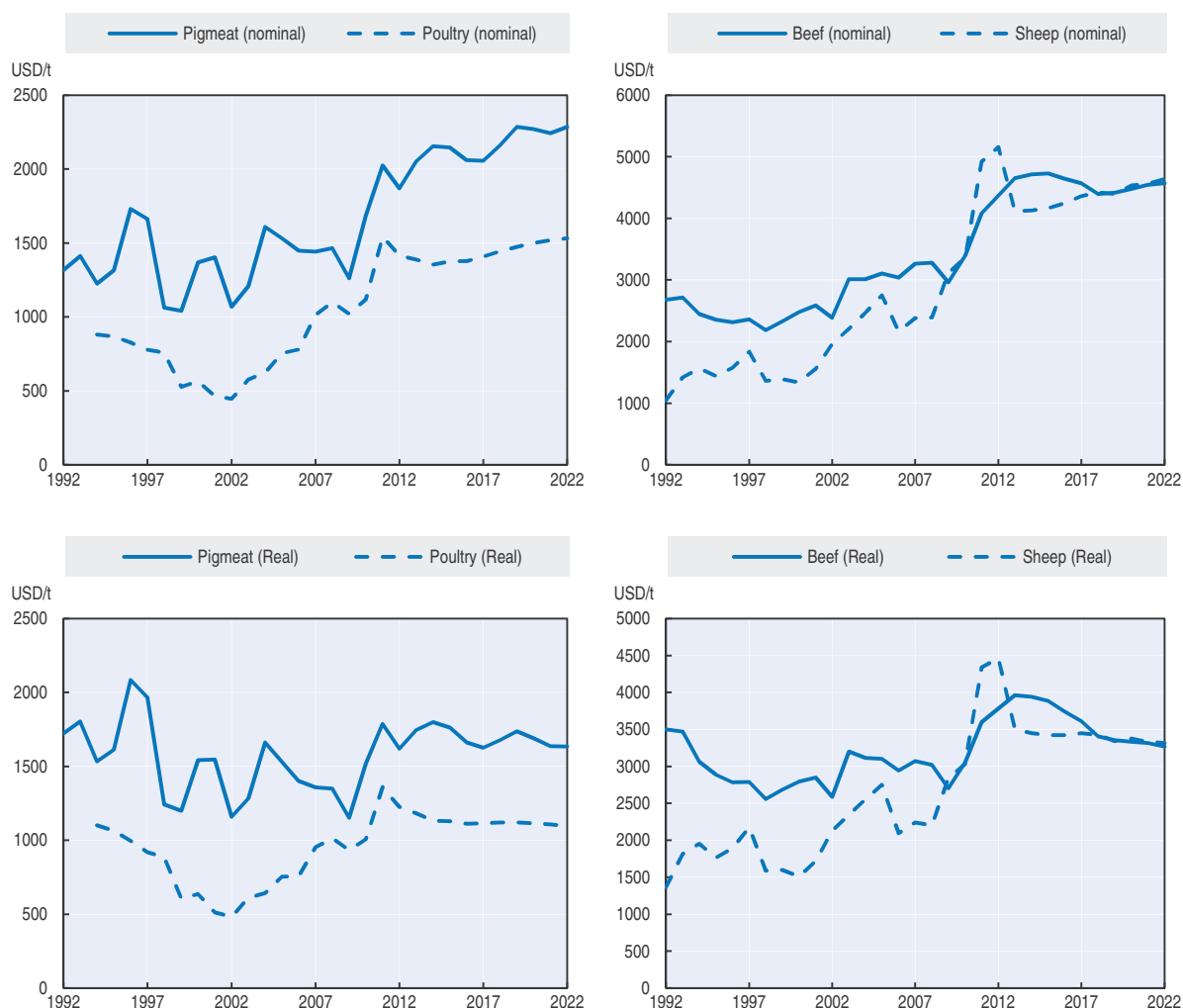
Meat

Market situation

The market situation for the meat sector is generally characterised by high nominal output prices, underpinned on the demand side by rising incomes from rapid growth in the developing countries, and on the supply side by high input costs, notably for feed grains, energy related inputs and labour. The combined effect of higher output prices and increased production costs tend to favor production in developing countries, where low input production systems prevail. Meat production growth has slowed, notably for poultry which in the past has experienced the highest rates of output increases. Meat demand in developing countries continues to be strong as higher incomes and urbanisation lead to food consumption changes favouring increased proteins from animal sources in diets. Consumption levels have risen substantially in many emerging economies, particularly in China and other fast growing Asian countries in the last decade. However, per capita meat consumption has been stagnant in the OECD area over the last ten years. While growth in both production and trade is envisaged in the short term for poultry, pig, sheep and buffalo meats, bovine meat markets will initially be constrained by depleted herd numbers in major exporting regions, notably in the developed countries. Developing countries will continue to strengthen their role in dictating changes in global meat production, trade and consumption.

Projection highlights

- Meat prices will remain high in real terms over the next decade due to changing market fundamentals of slower production growth and stronger demand. Market tightening arises from the combined effect of high feed grain prices over the past six years which have substantially moved through the supply chain leading to reduced livestock producer margins and depleted livestock inventories in some of the major meat producing countries. At the same time, demand remains firm from rising incomes and population growth particularly in the emerging economies of the BRICS and more generally in many other developing countries.
- Global meat production is expected to grow at a moderate pace this decade, constrained by higher input costs and competing demand for land and water from alternative crops. Meat production growth is projected to slow to 1.6% p.a., compared to 2.3% p.a. in the previous decade. In the past decade, the key driver behind the fast pace of meat production growth was the poultry sector, but it will also be largely responsible for the rapid deceleration in meat production over the next decade. Poultry meat production growth slows from 3.7% p.a. in the last ten years to 1.9% p.a. in the projection period. Meat production growth is dominated by developing countries, which will account for approximately 80% of the additional output to 2022.
- World meat consumption continues to enjoy one of the highest rates of growth among major agricultural commodities. But in some parts of the globe, demand appears to be reaching saturated levels in per capita terms, leading to a slowdown in growth. The

Figure 7.1. **World prices¹ in both nominal and real terms expected to remain strong**

1. US Choice steers, 1100-1300 lb dressed weight, Nebraska. New Zealand lamb schedule price dressed weight, all grade average. US Barrows and gilts, No. 1-3, 230-250 lb dressed weight, Iowa/South Minnesota. Brazil average chicken producer price ready to cook.
Source: OECD and FAO Secretariats.


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Table 7.1. Annual changes (% p.a.) in world meat production, exports and consumption per capita

	Production		Exports		Per capita consumption	
	2003-2012	2013-2022	2003-2012	2013-2022	2003-2012	2013-2022
All meats	2.3	1.6	4.3	1.6	1.3	0.6
Beef and veal	1.2	1.5	1.7	1.6	0.2	0.5
Pig meat	1.8	1.4	4.8	0.8	0.7	0.4
Poultry	3.7	1.9	6.7	2.1	2.5	0.9
Sheep meat	2.1	1.3	0.3	1.3	1.0	0.3

Source: OECD and FAO Secretariats.

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pattern of slowing consumption growth may strengthen over the next decade. Although demand growth for poultry is also expected to slow in coming years, it remains the leader in the meat complex, due to its status as the cheapest and most accessible source of meat protein. As such, it is expected to account for nearly half of the additional meat consumed by 2022 relative to the base period (average 2010-12). In developing countries, annual per capita meat consumption will increase by 2.6 kg r.w.t. over the period, with poultry accounting for 60% of this increase. Growth is led by the emerging economies of the BRICS which is projected to post a 4 kg r.w.t. gain in consumption, and if India is excluded, the average gain is a large 8 kg r.w.t. per person, reaching over 60 kg r.w.t. by 2022, and approaching the level of 66 kg r.w.t. in the OECD area. While remaining high in per capita terms, consumption in the OECD area has largely been stagnant for the last decade, due to various factors including population aging and changing demographics as well as increased health and dietary awareness.

- World meat exports are expected to increase by 19% by 2022; i.e. an annual increase of 1.6% which compares to 4.3% p.a. in the previous decade. Poultry and bovine meat shipments are the primary drivers of export growth, which together account for 80% of the additional trade.

Market trends and prospects

Prices

In real terms, meat prices in 2012 stood at 15-20-year highs (Figure 7.1). They are projected to remain on a high plateau during the Outlook period, but will fall from current levels by 2022, with nominal prices for beef and sheep meat projected to be around USD 4 500/t c.w.e., respectively. Pigmeat and poultry meat prices are anticipated to increase to USD 2 243/t c.w.e. and USD 1 518/t r.t.c., respectively, in the same period (Figure 7.1).

A key factor that underpins high meat prices is rising production costs, notably feed. Feed costs will remain at high levels over the Outlook and impede supply response to rising demand. Meat-to-feed price margins as well as feed conversion ratios are expected to improve in the next decade, but these efficiency gains will not be strong enough to fully compensate for the detrimental effects on supply of high feed costs. For poultry meat, where supply typically shows a faster response to price and cost changes, adjustment to higher feed costs has already taken place, and real prices over the next decade are anticipated to remain flat, largely following the pattern of real feed prices

Production

World meat production is projected to grow more slowly relative to previous years, at 1.6% p.a. during the projection period. The deceleration is due not only to high feed and energy costs, but also the result of competition for land, water and labour from alternative crops which are also experiencing relatively high prices. Most of the production growth for meats will take place in the developing world (Table 7.1 and Figure 7.2)

The projection indicates a strong deceleration of poultry meat output growth compared to past decades where it was the engine behind the notable expansion of total meat production. On a retail weight basis, poultry overtook pigmeat as the world's largest meat sector. Rapid growth was attained in a context of high efficiency in the conversion of grain to meat, and high productivity gains arising from increased technical efficiency and economies of scale. These gains are expected to be increasingly harder to obtain in coming

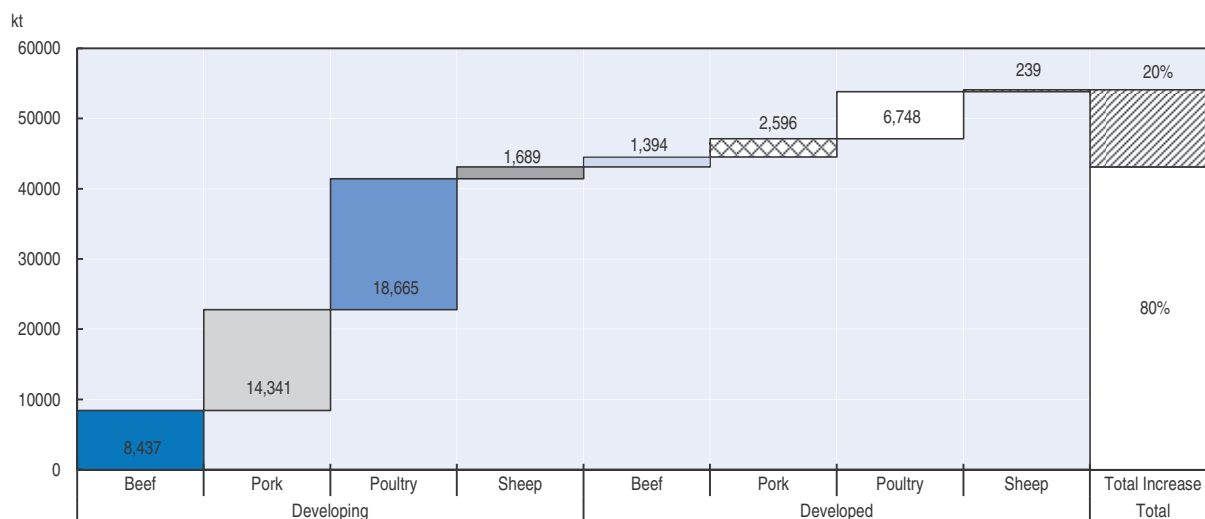
years as existing production technologies are widely diffused. Global poultry production, which grew by a fast 3.7% p.a. in the last decade, is projected to grow 1.9% p.a. over the Outlook, reaching 129 Mt, or 37% of the global meat supply. Pigu meat production is projected to grow 1.4% p.a., reaching 127 Mt, or 36% of the world's meat supply. Global beef production, which has stagnated in recent years, is anticipated to start growing more rapidly as national herds rebuild, and may increase by 1.5% p.a. over the Outlook attaining 77 Mt, compared to a growth rate of only 1.2% p.a. in the previous decade. The share of beef meat in the global meat supply should remain at about 22% over the next decade. Sheep meat, at a 5% share, is projected to grow by 1.3% p.a., reaching 16 Mt by 2022.

Productivity growth in the meat complex, which has been significant in recent years, is expected to decelerate in the next decade. In developed countries, further improvements in breeding and herd management practices, and especially improved feeding practices that have enabled rapid growth in meat production will be harder to come by as potential gains from technical efficiency and scale are progressively being achieved. For these countries, future productivity gains will depend increasingly on innovation and technology generation; i.e. on further investment in research and development (R&D). Conversely, in developing countries increasing productivity from wider diffusion of existing technology and the realisation of economies of scale is still anticipated in coming years, except perhaps in many African countries, where national extension services are poorly equipped and credit provision is poor.

In most of the BRICS economies, continuing productivity gains are expected from technology adaptation and diffusion, but with gains from scale expected to be harder to obtain because the industry is already highly concentrated. In addition to increased farm productivity, improvements in supply chain management, and in particular, cold chain management has and will continue to have a positive impact on the growth of the sector. Much room for improvement exists in regions where investments on manufacturing and other infrastructure have been limited, such as Sub-Saharan Africa.

Figure 7.2. Meat production growth dominated by developing countries

Production growth: by region and meat type, 2022 vs. base period (kt c.w.e. or r.t.c.)



Source: OECD and FAO Secretariats.

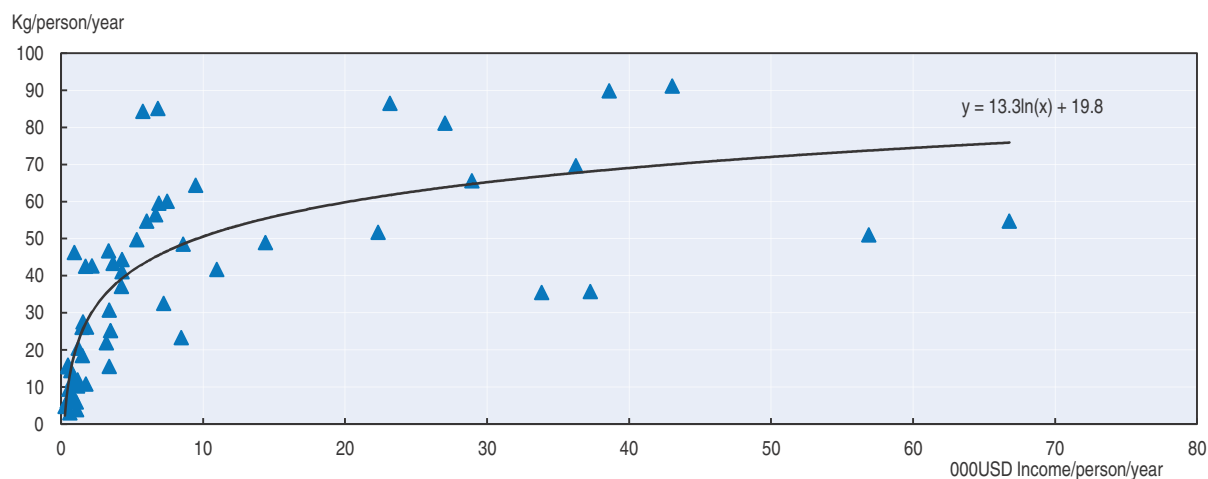
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Consumption


In the longer term, the principal driver of production is product demand, with time lags associated with biological and technical limits depending on the type of meat. The demand for meat is determined by many factors, including cultural habits and religious observances. These factors do not change much over a decade. For example, India is largely a vegetarian country, and its per capita meat consumption is less than 5 kg per capita r.w.t. p.a. People in many countries do not eat pigmeat at all. Location also affects meat demand, as for instance in coastal areas or near large bodies of water, where the local population may have greater access and appetite for fish and related products. Countries with specific types of pasture land and climate may raise more sheep. Population demographics may also play an important role. People in cities tend, although not in all cases, to eat more meat than in the countryside. Countries in fast transition to higher urban and lower rural populations may see meat consumption rising more rapidly. Changing age structure affects the evolution of consumption as older people tend to consume less than younger people.

In the context of globalisation and the so-called westernisation of diets, key drivers of meat demand are real prices and incomes. Income growth provides not only additional spending power but also access to modern appliances which may or may not impact meat consumption such as access to refrigeration (Box 7.1). Especially at low levels of income, the sensitivity of meat demand to changes in income is very high. As incomes rise however, changes have less impact on meat demand. As shown in Figure 7.3, per capita meat consumption rises steeply with higher annual per capita incomes to about USD 6 000, but beyond that level consumption growth flattens considerably as income rises further. Of course, there is a wide variation around the curve fitted to the data, given that many other factors are also affecting meat consumption. The various factors at work in conditioning meat demand are very much evident in the projections for meat consumption in the Outlook.

Figure 7.3. **Sensitivity of meat consumption to income declines as income grows**



Source: FAO and OECD Secretariats. Data for 2012 by country and regions of the AGLINK-COSIMO model.

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Box 7.1. Will increasing household refrigeration lead to higher meat consumption in China?

Meat demand in China has increased rapidly with important consequences for domestic feed demand and world agricultural commodity markets. While real prices of meat increased by 42%, per capita income in China rose almost by 250% from 1998 to 2012, driving per capita consumption of beef, pigmeat and poultry to increase by over 40%, from 34.2 kg r.t.w. in 1997-99 to 44.3 kg r.w.t. estimated in 2011-13 (Table 7.2). The *Outlook* projects that meat consumption in China will increase another 20% over the next ten years, based on factors such as continued high income growth, price prospects, changing diets and urban migration.

Table 7.2. Per capita consumption and real prices

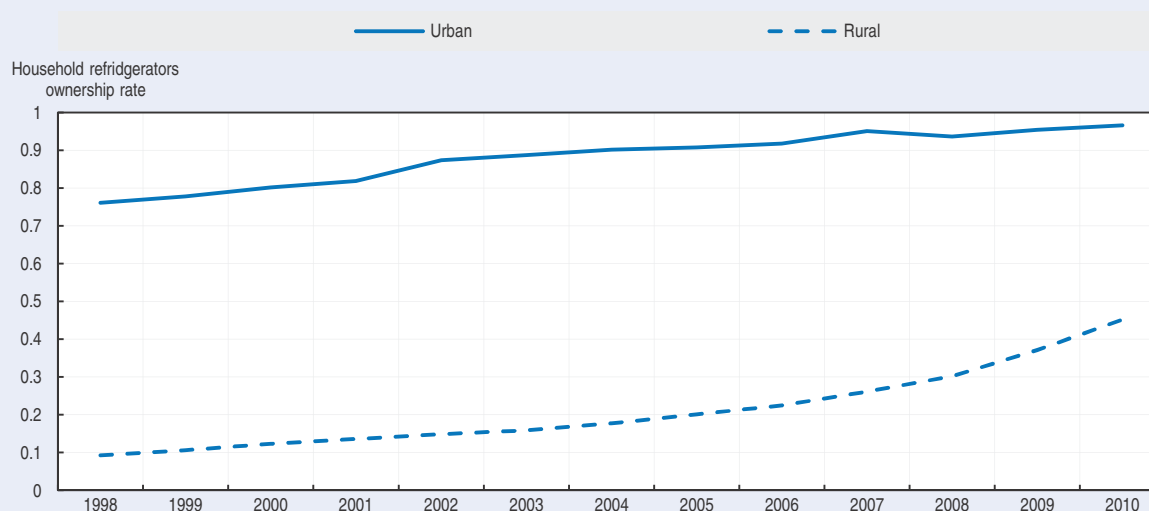
	1997-99	2004-06	2011-13	2022
Consumption, kg per person r.t.w.				
Beef	2.6	3.0	3.3	3.8
Pig meat	23.6	26.6	29.5	34.1
Poultry	8.0	9.2	11.4	13.6
Total	34.2	38.8	44.3	51.5
Real consumer prices, 2012 CNY per kg				
Beef	20.0	25.1	47.5	49.0
Pig meat	20.3	21.3	27.1	23.2
Poultry	14.7	14.6	19.4	17.3
Weighted average	19.0	20.0	26.7	23.6

Source: OECD and FAO Secretariat.

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Rapid expansion of household refrigerator ownership has been evident over the last several decades. The increase in refrigerator purchases is explained in part by rising household incomes, but also by subsidised consumer purchases. Purchases of refrigerators were subsidised in Shandong, Henan and Sichuan Provinces from late 2007 and were implemented throughout China by early 2009. Refrigerator ownership has expanded most rapidly in rural areas (Figure 7.4).

Figure 7.4. Recent growth in refrigerator ownership in China



Source: Chinese Statistical Yearbook, various years.

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Box 7.1. Will increasing household refrigeration lead to higher meat consumption in China? (cont.)

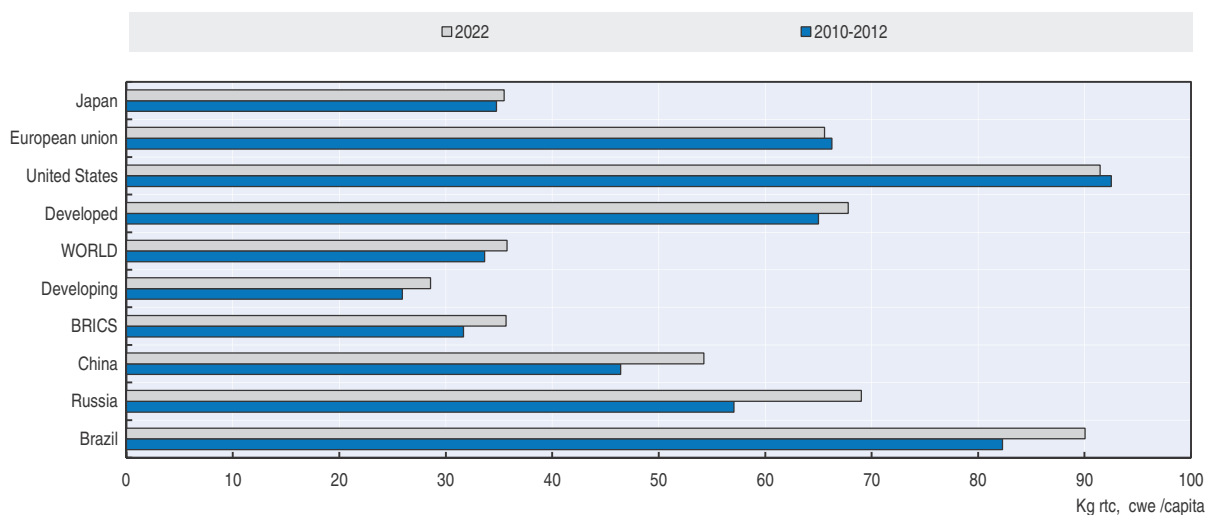
The effects of refrigerator ownership on home meat consumption have not been widely studied, even though this has been a major trend in China for many years. Available studies are dated and have mixed results (Lyon and Durham, 1999; Gale et al., 2005; Zhao and Thompson, 2013).¹ Some studies suggest refrigerators have led to an increase in meat purchases by allowing consumers to store meat longer, making consumption more convenient and practical. Other studies suggest a negative relationship as refrigerators reduce meat waste while, at least temporarily, the purchase restricts consumer expenditures on meat.

The *Outlook* suggests that meat demand in China will continue to increase over the next ten years but these projections may over or underestimate actual growth depending on the net effect of increased household refrigeration. In rural China, the potential for increased household refrigeration is still very large. If, for example, the net effect is positive, there could be a stronger expansion in future meat demand than might otherwise be expected based on price, income and diet trends. Greater than anticipated increases in meat demand would lead to higher prices of meats in China as well as some combination of increased meat production, with more use of grain and oilseed meal in feed, or more meat imports compared to the current *Outlook* projections.


1. Gale, F., P. Tang, X. Bai, and H. Xu. 2005. "Commercialization of Food Consumption in Rural China", *Economic Research Report*, ERS. Lyon, C. and C. Durham (1999), "Refrigeration and Food Demand in China: Can Refrigerator Ownership Help Predict Consumption of Food Products in China?" In: *Chinese Agriculture and the WTO*, Proceedings of the WCC-101, 2-3 December. Zhao, J. and W. Thompson. 2013. "The Effect of Refrigerator Use on Meat Consumption in Rural China", *Selected Paper*, Southern Agricultural Economics Association Annual Meeting, Orlando, Florida.

World meat consumption is projected to increase to 347 Mt by 2022, which on a per capita basis represents an increase of 6% relative to the base period. Though this growth is lower than in previous decades, meat consumption remains one of the fastest growing foods among the major agricultural commodities. In developing countries, where consumers will eat 84% of the additional meat consumed, per capita consumption will increase by 10% relative to the base period, with poultry accounting for 60% of the increase. Consumers in developed countries will eat on average 4% more meat per capita, with poultry accounting for 87% of the additional meat consumed (Figure 7.5 and Table 7.1).

Figure 7.5. Increase in meat consumption, by region between 2022 and the base period



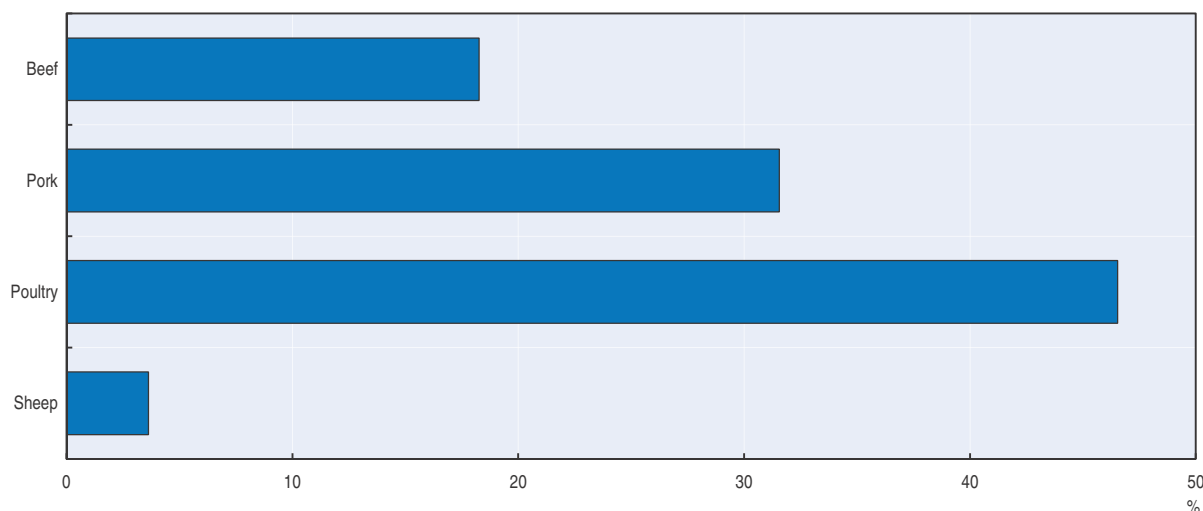
Source: OECD and FAO Secretariats.

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Poultry and pigmeat are the most popular meat products consumed worldwide today, occupying two-thirds of the “meat basket”. Generally speaking, half of the global increase in meat consumption is accounted for by poultry meat (Figure 7.6). Consumers in developed countries, with an aging population and already high rates of per capita consumption, are not projected to significantly increase animal protein intake. Also, consumers in developed countries are increasingly more concerned by meat production systems, food safety and animal welfare which may also impact on their consumption pattern. In developing countries, conversely, per capita consumption growth continues to increase with income and population growth.

Figure 7.6. **Poultry shares of the additional meat consumed continue to dominate**

Share in percentages by meat type, 2022 vs base period



Source: OECD and FAO Secretariats.

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Pigmeat consumption is currently the highest, but eventually poultry meat is expected to gain some market share during the projection period. The combined share of bovine and sheep meats consumed in the world will remain unchanged at 27%. While red meats will see a progressive erosion of their share in the meat basket, there is one exception to this rule in buffalo meat. Buffalo meat originates from the culling of the Asian water buffalo which is used for milk production and traction. Buffalo meat is much cheaper than bovine beef and yet has similar organoleptic properties; it has found acceptance among consumers in developing countries and has become an attractive proposition to traders, notably from India where slaughter of bulls and unproductive heifers is allowed.

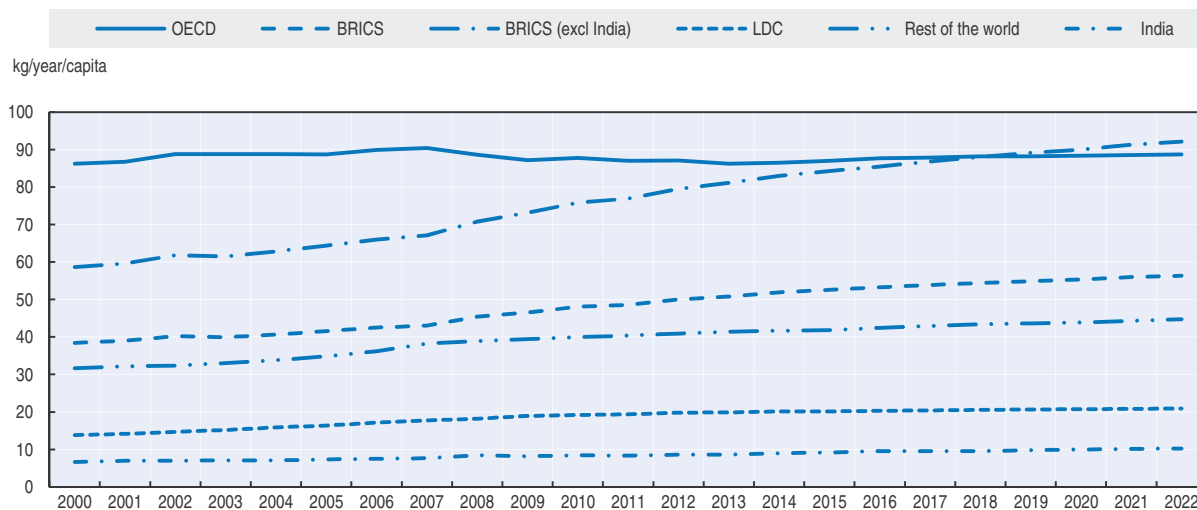
One longer term question is whether there may be a limit to per capita meat consumption growth.* Given current trends, convergence in consumption patterns is occurring, albeit slowly and from a highly dispersed base. It is highly unlikely that countries would tend to one “standardised” consumption basket, but given various conditioning factors, what will be the various levels of meat consumption as economies mature? OECD

* This is because meat is relatively inefficient in terms of delivering calories and proteins. It may take 6-8 tonnes of grain/protein ration to produce a tonne of bovine meat c.w.e., 3-4 tonnes to produce a tonne of pigmeat c.w.e., and 2-3 tonnes to produce a tonne of poultry meat r.t.c. In addition, water requirements for livestock production are high, manure handling may be expensive and polluting, and greenhouse gas emissions can cause environmental problems.


countries provide a benchmark of a “mature” market. Including fish in the basket, the OECD area reached a peak meat and fish consumption of some 90 kg r.w.t. per capita in 2007, OECD consumption is expected to stay around 89 kg r.w.t. per capita by 2022, where it has remained for much of the last decade (Figure 7.7). Consumption in the BRICS has grown rapidly and is projected to rise by almost 6 kg r.w.t. per capita over the next decade. If India, which will add less than 2 kg r.w.t. per capita by 2022, is excluded, the average consumption of the group will rise by almost 13 kg r.w.t. per capita to 92 kg r.w.t. per capita by 2022, exceeding the OECD average. The combined group of OECD and BRICS (excluding India) comprise over 3 billion people for whom little additional aggregate meat and fish consumption is expected beyond 2022. Less certain are the long-term growth rates in countries with much lower per capita meat and fish consumption by the end of the projection period such as India (10 kg r.w.t. per capita by 2022) and the LDCs (21 kg r.w.t. per capita by 2022).

Figure 7.7. **Trends in per capita meat and fish consumption (r.w.t.)**

Per capita consumption in kg per year by region



Source: OECD and FAO Secretariats. Data on a retail weight basis.

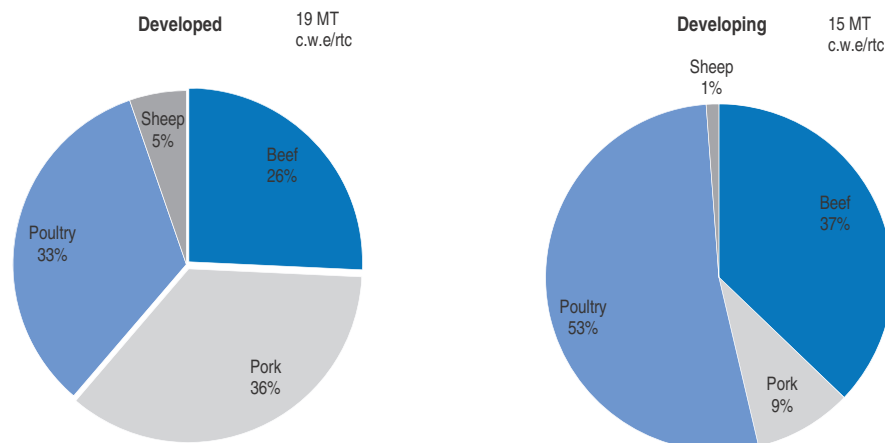
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Trade


The primary drivers of trade reflect comparative production advantages and local demand factors affecting both importers and exporters. Export growth will be led by poultry and bovine meat shipments. World meat exports are expected to increase to 35 Mt, a 19% growth by 2022 compared to the base period. This is an annual increase of 1.6% which compares to 4.3% p.a. in the previous decade. World imports of meat continue to be dominated by several countries notably Japan, the Russian Federation, Mexico, Saudi Arabia and Korea. World exports will originate from both developed and developing countries, though pigmeat trade will continue being dominated by developed countries (Figure 7.8).

Led by Brazil, the United States and India, beef trade is expected to continue to increase during the Outlook period. Beef exports from the United States will expand, *inter alia* from greater access to Japan which has relaxed its cattle slaughtering age restriction. Brazilian beef exports are projected to undergo a steady growth in line with an expected expansion of domestic output and sustained import demand from the Middle East. Australia beef exports are also expected to rise as a result of increased demand from the United States, South-East

Figure 7.8. Share of export of beef, pigmeat, poultry and sheep in 2022 by regions
Overall meat export to reach nearly 34 Mt by 2022 a 13% increase from the base period 2010-12



Source: OECD and FAO Secretariats.

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Asia and the Middle East. India has substantially expanded its exports of buffalo meat, with export unit values on average one dollar per kg cheaper than other beef. This price margin gives it a substantial competitive edge in Asia and the Middle East, where developing countries, notably Viet Nam, have seen a rapid surge of buffalo meat imports. Brazil and India exports will account for half the increase in exports by 2022, compared to the base period.

Aggregate growth in pigmeat trade will be relatively modest during the *Outlook* period, but some changes in the composition of trade are expected. North American pork shipments will increase faster than those from the rest of the world, and the region will become the dominant player in world markets, particularly in the Pacific market. Exports from Brazil, which until recently were expanding rapidly, will slow as a result of an increase in domestic consumption. Eastern Europe, South America and China are expected to remain the main destination of Brazil exports. Russian imports are projected to be stable as government policy stimulates domestic production which is gradually matching the growth in Russian demand. EU exports will stagnate due to the combined effect of a strong Euro and higher production costs due to among others higher oil prices and the implementation of stricter animal welfare requirements. Nevertheless, the European Union will maintain its position as a large pigmeat trader. Japan remains the leading pigmeat importer despite its ageing and declining population. Net imports by China, where half of the world's pigmeat is produced and consumed, is expected to nearly double during the *Outlook* period. Nevertheless, the additional pigmeat imported would represent a small fraction of the vast Chinese market.

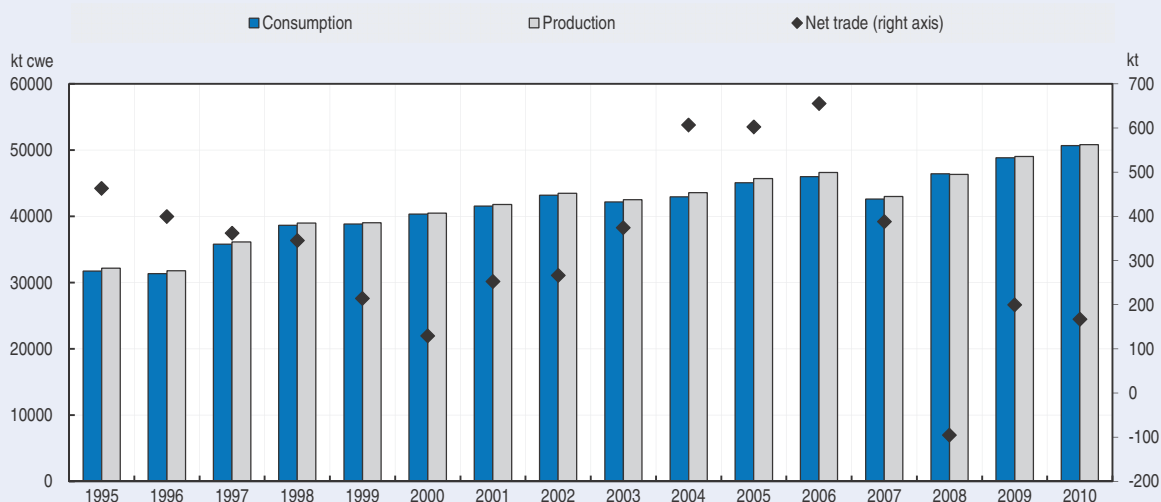
China's net trade position *vis-à-vis* pigmeat is a key uncertainty for world markets. Due to its extraordinary volumes both in terms of production and consumption, unforeseen events in China could easily induce import surges of pigmeat from the world market, with potential to severely impact international markets. Government policies will continue to support the pork industry through the scaling up of production and the modernisation of markets. These include buying into intervention stocks, setting up futures markets, and supporting R&D and the scaling up of production facilities. Maintaining its self-sufficiency levels in pigmeat over the ten year period will be a challenge for China. Management of land and increasing water constraints, for example, will play a major role in China's ability to remain self-sufficient in this meat (Box 7.2).

Box 7.2. Increased Chinese pork import implications for world markets


China is an emerging major player in the world pork market. In 2012, domestic production and consumption reached historical highs, representing over 45% of world totals. China's market presence is not only due to its leading position in pork production, but also increasingly due to the volatility it introduces to global trade balances and prices through import fluctuations. Over the past decade, China's domestic production and consumption has been increasing, although net trade has oscillated significantly (Figure 7.9).

Per capita pork consumption in China increased to 38 kg in 2012, up 13% in ten years. It is expected that pork consumption will continue its upward trend over the Outlook period, with average annual growth estimated at 1.6%. Coarse grain consumption in China represented roughly 18% (213 Mt) of world consumption in 2012, and is estimated to continue growing by 1.3% p.a. Historically, China has been mostly self-sufficient in pork and coarse grains. China's average self-sufficiency levels for pork and coarse grains are roughly 100% and 95%, respectively, and are expected to remain at these levels over the coming decade. Maintaining these self-sufficiency levels in both commodities over the ten-year period will be a challenge. Management of land and water constraints, for example, will play a major role in China's ability to remain self-sufficient.

Figure 7.9. China pork production consumption and trade



Source: OECD-FAO Secretariats.

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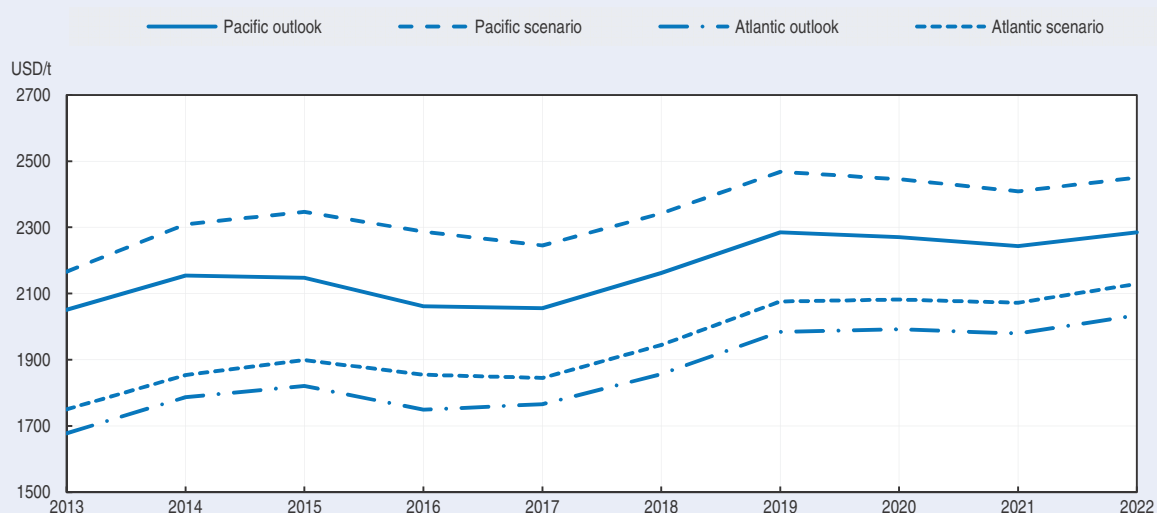
To examine the implications of lowering China's self-sufficiency in pork, a scenario analysis was undertaken that assumes lower growth in pork production until pork and coarse grain self-sufficiency levels are equal at 95%. Chinese pork production decreases, when compared to the baseline, by an annual average of 2.3 Mt (a 1% annual decline in self-sufficiency). As a counterbalance to this lower production, Chinese pork imports increase by an annual average of 1.5 Mt. These are distributed as follows among top Chinese pork suppliers: Pacific exporting countries (68% to 60%), the European Union (30% to 25%), and Brazil (2% to 15%) from 2013 to 2022. In 2012, following Chinese government approval of sanitary standards compliance, certain pork slaughterhouses from the Brazilian state of Santa Catarina gained access to the Chinese market. Year-to-date trade data indicate Brazil captured roughly 1% of Chinese imports. This scenario allows for a continued 1% annual growth in the share provided by Brazil over the Outlook period.

The increase in Chinese pork imports is sufficient to have international price effects. Since the Chinese imports are distributed among the European Union, the United States, Canada, and, to some degree, Brazil, prices would increase in both the Atlantic and Pacific pork markets (Figure 7.10). On average, the Atlantic,

Box 7.2. Increased Chinese pork import implications for world markets (cont.)

Pacific, and European Union pork prices would increase by 5%, 8%, and 5%, respectively, over the Outlook period. Also, with Chinese pork imports more than doubling in the scenario, it is assumed that domestic pork prices become more linked to world prices. These price increases are somewhat fully transmitted to the domestic pork price in China (6% annual average increase), resulting in some reduction in domestic consumption.

Figure 7.10. Projected world pork prices under the scenario analysis

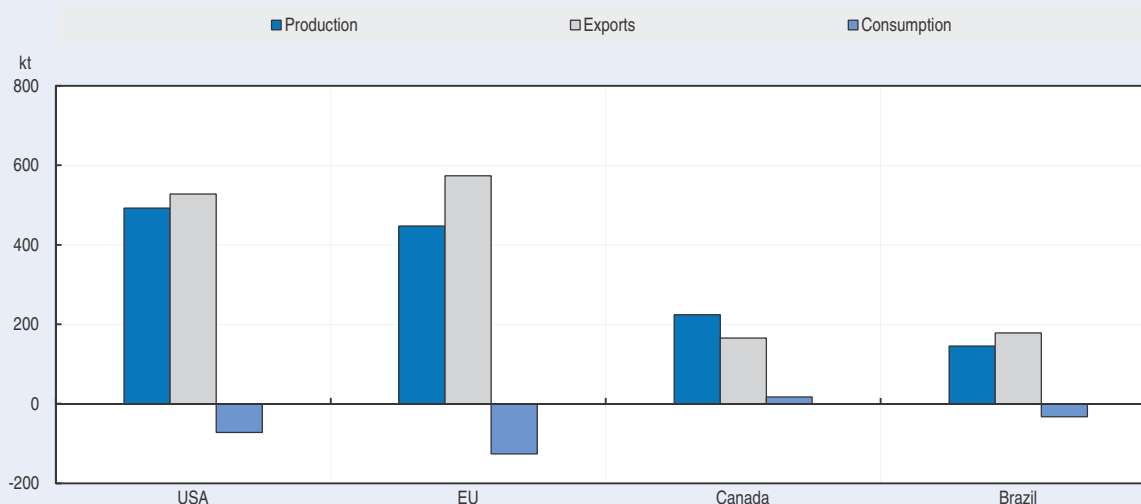


Source: OECD-FAO Secretariats.

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By the end of the projection period, the higher world prices increase pork production in the United States, the European Union, Canada and Brazil by 4%, 2%, 9%, and 4%, respectively. The United States would see the most significant increase in pork export volume by 2022 followed by the European Union, Canada, and Brazil (Figure 7.11). Consumption would fall slightly in each of these countries. With higher domestic pork prices, the Chinese pork consumption falls by an annual average of 730 kt (-1.3%), somewhat mitigating the increase in Chinese imports.

Figure 7.11. Projected pork production, consumption and exports under scenario analysis: volume changes from the baseline in 2022



Source: OECD-FAO Secretariats.

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Box 7.2. Increased Chinese pork import implications for world markets (cont.)

Lower growth in pork production over the *Outlook* period decreases domestic feed demand. Since the Chinese coarse grain market is highly self-sufficient, the decreased demand is mostly absorbed by domestic production and stocks with little impact on world markets. This results in lower domestic coarse grain prices, increasing food consumption, production of coarse grain based sweeteners, and other uses (Table 7.3).

Table 7.3. Projected Chinese coarse grain supply and demand under scenario analysis: % and volume changes from the baseline

	%/yr	Kt/yr
Production	-0.4	-864
Feed demand	-0.9	-1 380
Food demand	0.5	86
Sweetener demand	0.8	76
Other demand	0.2	137
Net trade	-2.6	240
Stocks	-0.1	-84
Domestic price	-1.2	-

Source: OECD-FAO Secretariats.

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In poultry, a slowing down of annual trade growth is anticipated, from an annual rate of 6.7% in the last decade to 2% p.a. during the *Outlook* period. The largest contributors to growth are the United States and Brazil, both of which will strengthen their dominance of world trade. By 2022, the United States and Brazil are projected to generate two-thirds of the expansion of world poultry trade. Elsewhere, an interesting development is heavy investments by the private sector in the Ukraine, with an expectation to be able to fulfil a growing demand in domestic and export markets. World poultry import growth will be led by countries in the Middle East and Southeast Asia. Purchases by the Russian Federation, once the world's largest importer, will progressively decline following higher domestic production. Mexican imports will remain stable as per capita consumption has matured. Similarly, imports by the European Union are anticipated to stagnate due to favourable domestic demand and prices developments as the industry quickly adapts to changes in cost conditions.

Australia and New Zealand continue to be the world's largest sheep meat exporters over the *Outlook* period. Mutton exports from Australia are expected to grow faster than those of New Zealand lamb, driven by increasing demand from an expanding middle class in the Middle East and Asia. Demand in the European Union, another important market, will initially remain weak due to the on-going economic downturn. In New Zealand, lower prices and higher profitability of dairy farming will continue to encourage the conversion of sheep farms to dairy operations, albeit at a slower rate than in previous years, reducing the growth of export availability throughout the projection period. Conversely, attractive wool prices are expected to stimulate Australian sheep production and exports of mutton.

Key issues and uncertainties

Macroeconomic conditions and environmental pressures are two sources of uncertainty affecting meat markets in the medium term. More specific to the meat sector is the ever present danger of animal disease outbreaks. The potential sensitivity of market outcomes to this last issue needs particular attention. Any reduction in feed costs could also influence the meat sector. For example, the re-introduction of animal proteins in feedstuffs for fish such as the European Union is proposing to introduce in June 2013, could decrease feed grain use in the fishery sector and release supplies to the benefit of the meat sector.

In terms of macroeconomic conditions, meat remains one of the food commodities most sensitive to income growth, especially in low to mid-income countries where demand remains responsive to income growth. A slowing of economic growth in these countries will have considerable impact on markets. These impacts can be diverse and offsetting in nature. For example, while lower income growth may reduce the demand for meat, it may also create lower demand for fuel and reduce energy prices, with knock on effects to biofuel and feedstock prices and output with which meat production may compete.

Livestock inventories in this Outlook are projected to increase considerably. Environmental pressures and the associated mitigation costs are rising for the production of virtually all meats. New environmental taxes and legislation that condition production to environmental protection may affect investment in the sector. The livestock sector, and more precisely ruminants, is considered a key contributor to Anthropogenic Greenhouse Gas (GHG) emissions. More research is necessary to better assess and improve the environmental performance of the livestock sector, including the significant environmental services it can provide, with the aim of using resources more efficiently and creating more sustainable forms of production (e.g. improving off-take ratios – the ratio of meat output per livestock unit).

A number of animal disease incidents in the past have demonstrated the potential to adversely disrupt domestic and regional meat production and trade. Several cases of BSE have had widespread market impact. Swine influenza or swine “flu” caused considerable public concern in recent years. The African Swine Fever (ASF), a highly contagious hemorrhagic disease of pigs, could bring billions of dollars in loss to pigmeat industries if it should spread to European and Asian countries. With no vaccine or cure for the disease, mass culls and vigilant hygiene are currently the only defense. Countries and regions therefore value their disease-free status and make strenuous efforts to sustain it. Foot and Mouth Disease (FMD) is a case in point. The world beef and pigmeat trade is historically characterised by an Atlantic market and a higher price “FMD free” Pacific market. MERCOSUR member countries generally export to the lower price Atlantic market but access to the more lucrative Pacific market remains a strong incentive for MERCOSUR countries to seek the same “FMD free” status. The integration of the MERCOSUR into the Pacific market would bring significant changes to global meat production and consumption (Box 7.3).

Disease outbreaks of zoonotic scope, such as the Chinese highly pathogenic avian influenza H7N9 or the H7N3 Mexican outbreak, also loom as potential factors that could impact markets significantly not only across meat sectors, but also consumer behaviour. The 2003 episode of Bovine Spongiform Encephalopathy (BSE) in the United States is an example where impacts on world meat trade have proved severe when the country

Box 7.3. Market impacts of MERCOSUR achieving “Foot and Mouth Disease (FMD) Free” status

World beef and pork trade is generally characterised by an Atlantic market and a higher price “FMD free” Pacific market. MERCOSUR member countries generally export to the lower price Atlantic market but access to the more lucrative Pacific market is a strong incentive for MERCOSUR countries to seek the same “FMD free” status.

This scenario analysis estimates the impacts of MERCOSUR countries’ integration into the Pacific market, thereby increasing competition for the price premium markets. MERCOSUR member countries are the main red meat suppliers in the Atlantic market and a partial shift to Pacific markets would leave current importers (Europe, the Middle East, South America) with a significant reduction in supply, forcing arbitrage between the Pacific Rim and Atlantic markets. This arbitrage is implemented in the model with no quality premium given to the Pacific beef and pork prices.

This price and market unification lead to an average annual decrease in Pacific Rim beef and pork prices of -15.2% and -8.3%, respectively, over the *Outlook* period (Table 7.4). The tariff rate quotas that North America has maintained through the Uruguay Round Agreement Act (URAA) would become binding from 2015, preventing the full reduction in domestic prices. Domestic pork sectors in the Pacific Rim do not have this protection, resulting in a more complete price transmission. Atlantic beef and pork prices would increase by an annual average of 9.5% and 6.8%, respectively, over the *Outlook* period.

Table 7.4. Impact of MERCOSUR’s integration into the FMD free status red meat market

Price differences with respect to the baseline (%), annual average 2013-22.

	Beef	Pork
Pacific	-15.2	-8.3
Australia	-13.1	-7.5
Canada	-10.4	-7.7
Mexico	-11.6	-6.6
New Zealand	-14.8	-7.4
United States	-10.4	-7.6
Atlantic	9.5	6.8
Argentina	3.4	5.2
Brazil	6.6	5.4
Russia	9.5	6.8
Uruguay	8.7	6

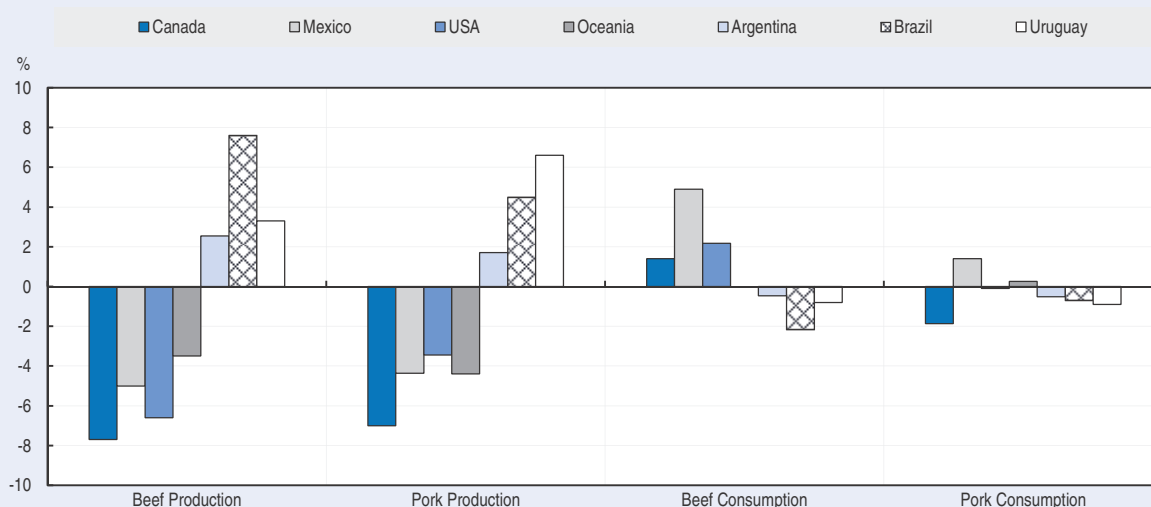
Source: OECD-FAO Secretariats.

StatLink  <http://dx.doi.org/10.1787/888932860883>

These price impacts bring significant changes to global production and consumption (Figure 7.12). Latent production capacity and price sensitive supply allows Brazil to realize the most pronounced increase in production (776 kt beef and 236 kt pork annually on average). US beef production decreases by an annual average of 6.2% over the *Outlook* period. Dependence on international pork exports results in a more pronounced decrease for Canadian pork production, relative to Mexico, the United States and Oceania.

Box 7.3. Market impacts of MERCOSUR achieving “Foot and Mouth Disease (FMD) Free” status (cont.)

Figure 7.12. Impacts on production and consumption
(% change from outlook, annual average 2013-22)



Source: OECD-FAO Secretariats.

StatLink <http://dx.doi.org/10.1787/888932860142>

Despite lower Pacific pork prices, pork consumption decreases in Canada and the United States. This is attributable to the relatively larger decrease in Pacific beef prices and the high degree of substitutability between the two red meats. This is not the case for Oceania and Mexico as pork consumption increases marginally. Table 7.5 summarises total consumption and production impacts and demonstrates how consumption is more price elastic than production in the short-term, due to the lengthy biological lag in red meat production.

Table 7.5. Red meat production and consumption (changes relative to outlook)

	Consumption (2013-14)	Production (2013-14)	Production (2013-22 avg)
Atlantic	-602 kt	386 kt	1692 kt
Pacific	784 kt	-330 kt	-1 924 kt

Source: OECD-FAO Secretariats.

StatLink <http://dx.doi.org/10.1787/888932860902>

The global trade redistribution that could result from MERCOSUR integrating into the Pacific Rim red meat market was estimated at up to 2.5 Mt annually. Larger price adjustments in the beef sectors, relative to pork, result in higher beef trade redistribution. For example, Brazil and Argentina red meat exports expand by 53% and 20%, respectively (Table 7.6).


Its large market share, low exports relative to domestic production and highly sensitive price responsiveness positions the United States to lose to the largest export market share. Decreases in red meat exports from Canada, Australia, and New Zealand are smaller in comparison. Mexican cattle exports, however, increase marginally. This is due to Mexico not being subject to a US import limit of live animals and US prices remaining relatively higher than Pacific prices throughout the period of analysis.

Box 7.3. Market impacts of MERCOSUR achieving “Foot and Mouth Disease (FMD) Free” status (cont.)

Table 7.6. Total red meat (including live animals) exports and imports ('000 t), annual average 2013-22

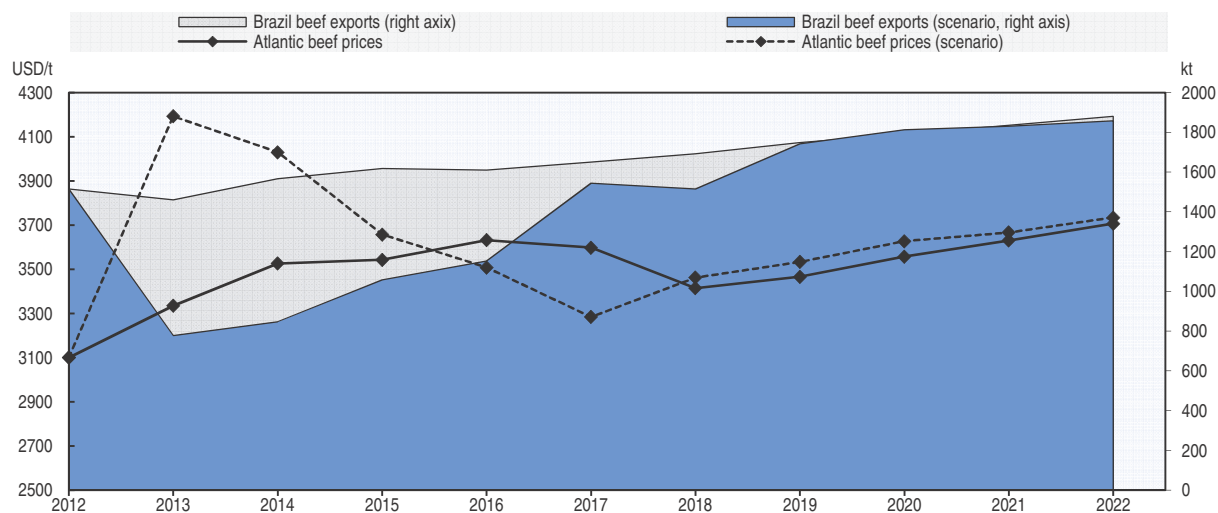
	Export			Import		
	Baseline	Scenario	% change	Baseline	Scenario	% change
Pacific						
Australia	1 590.2	1 498.0	-5.8	354.5	372.6	5.1
Canada	3 033.3	2 191.3	-27.8	490.2	597.5	21.9
New Zealand	530.6	509.2	-4.0	52.2	54.6	4.7
United States	3 994.9	2 798.7	-29.9	2 675.3	2 828.9	5.7
Mexico	463.6	514.1	10.9	968.2	1 286.7	32.9
Atlantic						
Argentina	485.5	580.1	19.5	42.1	39.7	-5.6
Brazil	2 277.9	3 473.2	52.5	105.0	105.0	-
Russia	0.0	0.0	-	2 018.0	1 799.3	-10.8

Source: OECD-FAO Secretariats.


StatLink  <http://dx.doi.org/10.1787/888932860921>

affected is a large exporter. BSE in the United States resulted in beef net exports falling by 60% in 2004 and only returning to pre-BSE levels in 2008. An isolated case of BSE in Brazil in 2012 did not affect exports but, for illustrative purposes, a decrease in Brazilian beef exports comparable to the US experience was simulated over the 2012-16 period using the AGLINK-COSIMO model. The simulated decrease in exports resulted in tighter global supplies and an increase in Atlantic beef prices of nearly 20% in 2012 (Figure 7.13). Higher beef prices in the Atlantic market would lead to reduced consumption, increased exports, or reduced imports for most countries; the exception here is Brazil, where low domestic prices would have stimulated domestic consumption.

Figure 7.13. Brazil: scenario on BSE Impacts on beef exports and prices



Source: OECD-FAO Secretariats.

StatLink  <http://dx.doi.org/10.1787/888932860161>

The world meat market is also highly fragmented from country-specific legislation on food safety and any new import restrictions pose a significant risk to the validity of the projections. These projections assume that no import bans with significant and long lasting effects on trade will occur during the *Outlook* period.



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