

Chapter 7

Meat

Market situation

The market situation for the meat sector is characterised by high nominal output prices for all meats, underpinned on the demand side by rapidly growing developing economies and on the supply side by high input costs, notably for feed grain and energy related inputs such as transport and cold chain storage. As feed costs moderate somewhat, increased profitability should assure expansion. These factors tend to favour greater domestic supply responses in developing countries, particularly for cheaper meats and meat cuts (poultry), and also where low input systems, including pasture, predominate. On the policy front, the prospects of a further opening of international meat trade that may result from the accession to the WTO of the Russian Federation, which is among the world's largest meat importers, will render a favourable trade environment for the sector. While growth in production and trade is envisaged in the short term for poultry, pig and sheepmeats, beef will initially be constrained by herds which have depleted in recent years in major exporting regions.

Projection highlights

- The strong rise in feed grain prices in the past five years is now moving substantially through the market chain and, with the exception of poultry where adjustments have largely been made already, is being reflected in higher meat prices. Prices are projected to remain high throughout the next decade, and in real terms about 11%, 17%, and 4% above base period (2009-11) values for bovine, pigmeat, and sheepmeat respectively. Real prices for poultry are projected to remain close to current levels. For all meats, real prices are currently at their highest levels of the past 15 to 20 years, and little moderation is expected as long as feed and energy prices remain high.
- Higher prices for meat will induce supply response, albeit limited by higher input costs in addition to competition for land and water. The combined effect of these factors will slow global production growth for meat to 1.8% p.a. in the outlook period compared to 2.2% p.a. in the previous decade. Bovine meat production is projected to increase 1.8% on average each year, while that for pigmeat and sheepmeat may grow 1.4% and 1.8% respectively. Poultry remains the fastest growing meat sector, with growth projected at 2.2% p.a. Developing countries will increase their share of global production in all meat categories, and by the end of the period will account for 58%, 64%, 63% and 78% of bovine, pig, poultry and sheepmeat production respectively. Increasing returns to scale will continue to concentrate production in fewer and larger farm units, not only in developed countries, but increasingly also in emerging countries. This structural change will continue to increase the reliance of meat production on feed grain inputs.
- World meat consumption continues to grow at one of the highest rates among major agricultural commodities. Growth in developing countries will capture 82% of the additional global consumption over the projection period. *Per capita* consumption will increase by 3.2 kg p.a., with poultry accounting for 70% of this increase. By 2021, consumers in developed countries will eat an extra 3.6 kg of meat *per capita* relative to the base period,

which will also be mostly poultry, except for Eastern Europe where consumption of red meats still has a substantial growth potential.

- Despite strong meat prices through the projection, meat imports by developing countries are expected to increase, driven by population and income growth and high income elasticity of demand. Equally so, strong prices will result in sustained export earnings, which will encourage large meat exporting countries to invest in international meat markets despite the high prevailing incidence of food-safety and sanitary import bans.

Market trends and prospects

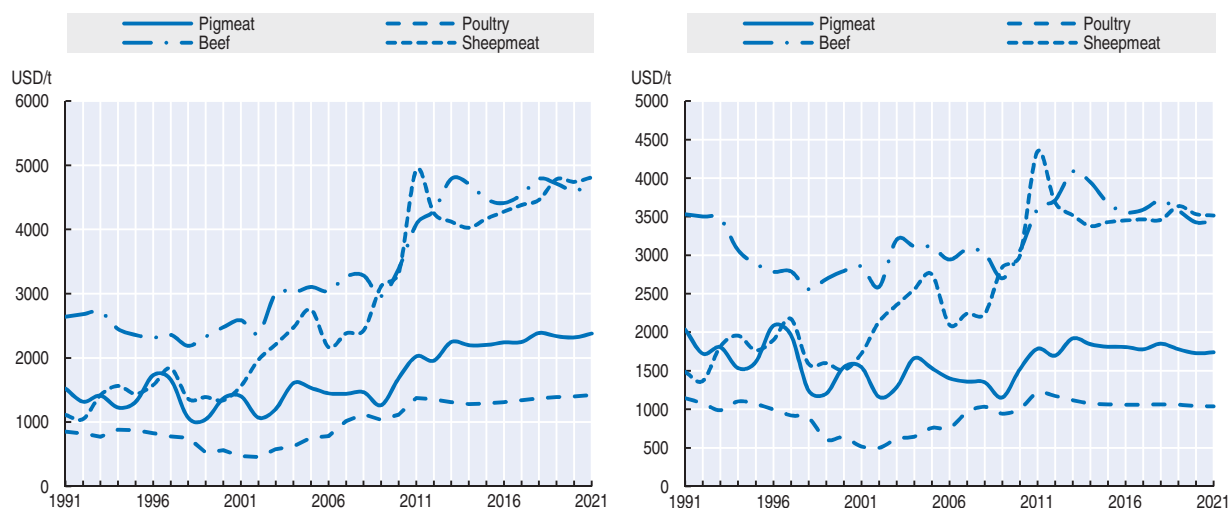
Prices

Meat prices will remain on a high plateau during the outlook period under persistently high production costs due not only to high feed prices and energy related inputs including transport and cold chain supply costs, but also to increasingly more stringent food safety, environmental, and animal welfare regulations (traceability, housing, transportation, etc.). Nominal prices for beef and sheepmeat are projected to be USD 4 717/t c.w.e. and USD 4 812/t c.w.e. respectively in 2021, whereas already high pigmeat and poultry prices will increase to USD 2 380/t c.w.e. and USD 1 419/t r.t.c. respectively. Sheepmeat prices, which have recently seen a drop due to a higher supply and subdued demand in the European Union, are expected to remain at firm levels (Figure 7.1).

In real terms, meat prices in 2011 stood at 15-20 year highs. Feed costs have moderated in the past year, but they are anticipated to remain at high levels over the outlook period. Output price to feed price ratios for bovine and pigmeat, are anticipated to remain at low levels throughout the outlook period. For poultry meat, which typically shows faster response, adjustment to higher feed costs has already taken place, and real prices over the next decade are anticipated to remain flat, compared to recent prices in markets (Figure 7.1).


Figure 7.1. **World prices in real terms expected to remain strong**

Nominal (left figure) vs. Real (right figure) meat prices¹



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.

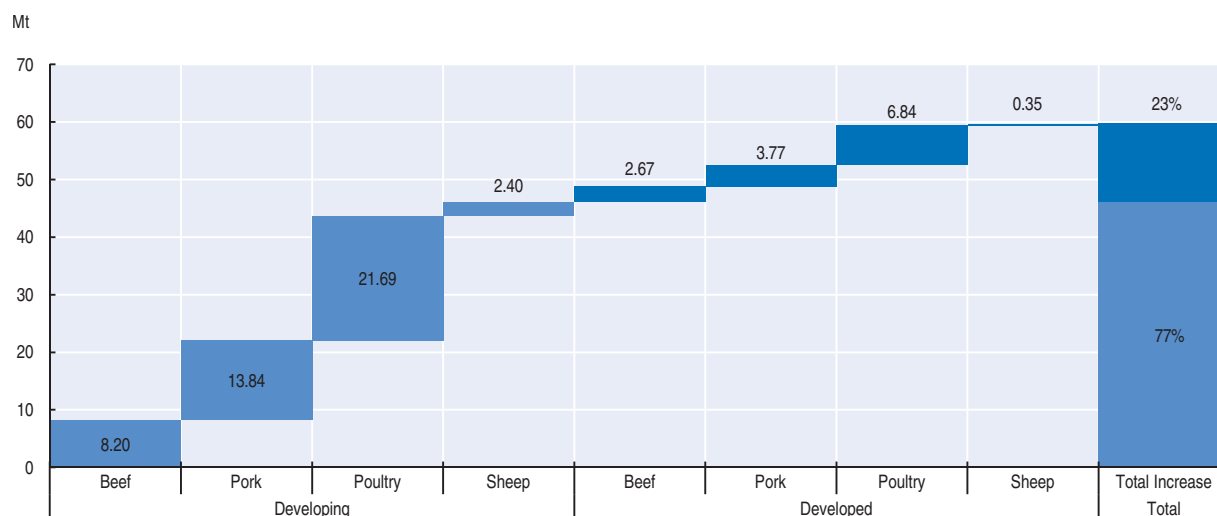
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Production

Although meat prices will remain on a high, supply response may be limited in many countries and regions by constraints on natural resources, competition for land and water from alternative crops, and insufficient investments on infrastructure in key regions richly endowed with natural resources for livestock production (Brazil, the Russian Federation and Sub Saharan Africa). Annual world meat production growth during the outlook period is projected to slow from an average 2.2% the previous decade to 1.8% p.a., largely due to slower growth in Latin America, particularly Brazil and Argentina, which grew strongly in the previous decade. In the Russian Federation, growth in meat production is anticipated to slow as a result of accession to the WTO. Poultry and pigmeat production, which grew by a large 14% p.a. and 5% respectively in the last decade, are projected to grow in the 2% p.a. range over the outlook period. More generally, developing countries will capture 77% of the additional meat output growth over the outlook period (Figure 7.2).

Figure 7.2. **Meat production growth dominated by developing countries**

Production growth: By region and meat type, 2021 vs. base period (c.w.e. or r.t.c.)



Source: OECD and FAO Secretariats.

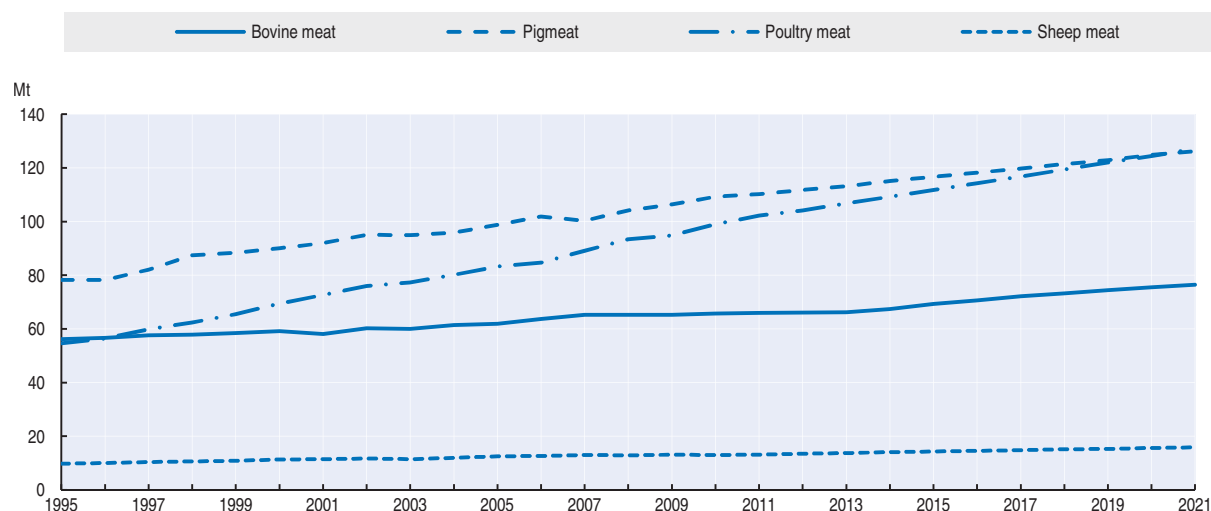
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Global bovine production, which has stagnated in recent years, is anticipated to start growing more rapidly as herds rebuild by 2014, and may increase 1.8% p.a. over the outlook, compared to a growth rate of only 1.2% in the previous decade. Poultry will remain the fastest growing sector (2.2% p.a.) and will have the highest volume production of all meats by the end of the outlook period, overtaking pigmeat (Figure 7.3). In Oceania, high profitability in the dairy industry has encouraged the conversion of sheep farms/land to dairying. The resulting reduction in global supplies of sheep has recently propelled prices to high levels. It is expected that, over the medium term, the flock is likely to expand, given price incentives, and bring prices back into line with other meats. In addition, improving productivity growth through better genetics as well as finishing lamb on grain to raise carcass weights, in certain countries, will contribute to raising sheepmeat production.


Productivity growth throughout the meat production chain has been significant in recent years. Despite rising costs, improved herds, breeding and herd management practices, especially improved feeding practices, have enabled growth in meat production

Figure 7.3. **Globally, poultry will overtake pigmeat as largest meat sector**

Production growth: By meat type, 1995-2021 (c.w.e. or r.t.c.)



Source: OECD and FAO Secretariats.

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and this trend is expected to continue through the outlook period (Box 7.1). Increasing productivity of livestock herds has been widespread, except in many African countries, where output per head has remained at very low levels for many years. Productivity in the meat sector is seen as critical in the long term, since it implies a lower level of inputs are required to produce a given output. For example, productivity gains that raise offtake ratios imply lower animal inventories that use extensive feed, land, water and other inputs, and help improve sustainability. The current projection foresees global increases in cattle numbers to 1.80 billion head, hog numbers to 0.97 billion, poultry to 24.3 billion, and sheep to 3.0 billion. Apart from increased farm productivity, improvements in supply chain management, in particular cold chain management, has and will continue to have a very important impact on the growth of this sector. This is especially true in many developing countries where storage and transportation of meat has been limited.

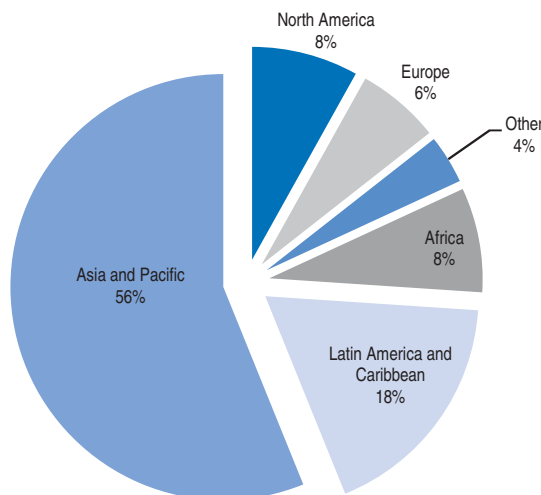
Consumption

Growth in demand will stem mostly from large economies in Asia, Latin America and oil exporting countries (Figure 7.4). Emerging economies will also increase their demand where income growth and urbanisation will strengthen the intake of animal proteins at the expense of foods of vegetal origin. Conversely in developed countries, where demand is largely saturated, a slowing down of income and population growth, ageing and the recurrence of food scares (*E. coli* and salmonella) will combine to curb demand for meats. The net result of these contrasting trends at the global level, points towards strong growth on a *per capita* basis, albeit lower than that experienced in previous decades.


Relative to the base period, by 2021 developed and developing country consumers put similar additional quantities of meat in their annual baskets: 3.6 kg and 3.2 kg r.w.t. respectively. However, the meats chosen by consumers are markedly different. Some 90% of the extra meat that consumers in developed countries put in their baskets is poultry, except for consumers in Eastern Europe where red meats have additional room for growth. Conversely, the extra meats which consumers in developing countries choose for their

baskets is more heterogeneous, consisting of 62% poultry, 19% pigmeat, 13% beef, and 6% sheepmeat. These are averages, whereby *per capita* consumption is likely to change from one region to another depending on local traditions. They nevertheless signal a trend in markets as *per capita* meat consumption progressively saturates.

Figure 7.4. **Increase in meat demand, by region, between 2021 and the base period**



Source: OECD and FAO Secretariats.

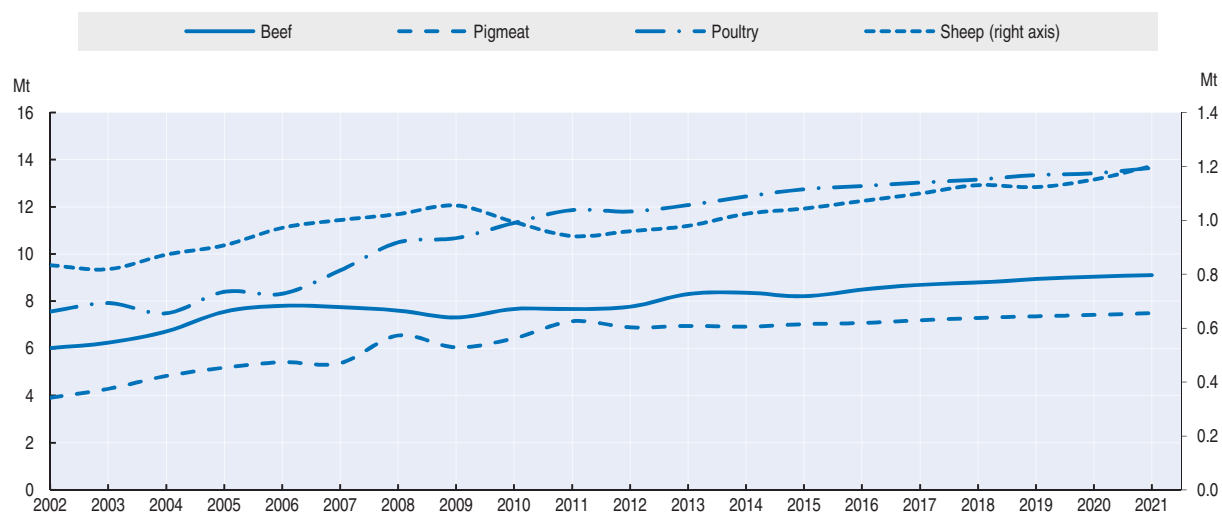
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Trade


Led mostly by an expansion of poultry and beef shipments, world meat exports will increase by 19% by 2021 relative to the 2009-11 base period (Figure 7.5). The bulk of the growth in meat exports is expected to originate largely from North and South America, which will account for nearly 70% of the total increase in all meat exported by 2021. These two regions will increase their combined share of total world trade in meat from 61% to 63%. US meat exports are projected to expand significantly in the outlook period, not only from the easing of BSE-related import restrictions, but also from the progressive lowering of import tariffs by Korea, following the coming into force of KORUS (bilateral free trade agreement) on 15 March 2012. Meat exports from the European Union are anticipated to stagnate over the outlook period due to a tight domestic supply of domestic produce following policy reforms. Japan is projected to remain the leading meat importing country by 2021, followed by China, Mexico and Saudi Arabia. The Russian Federation, expected to join the WTO shortly, remains one of the world's largest market players despite a significant fall in total meat imports.

Led by Brazil and the United States, beef trade during the outlook period will expand at 1.8% p.a. In the United States, larger exports stem from improved market access to FMD-free markets, including a lowering of tariffs by Korea and an expansion of the EU import quota for US beef free from growth-inducing hormones. A larger presence of US beef in the FMD-free "Pacific" market will affect the performance of Australia, Canada and New Zealand, whose exports are anticipated to stagnate. Exports of Brazilian beef to the Atlantic market, which in the past five years have been shrinking from the combined effect of strong domestic demand growth, sanitary export restrictions and falling output, will reach

Figure 7.5. Evolution of world exports of beef, pigmeat, poultry and sheep
Overall meat export to reach nearly 32 Mt by 2021, a 19% increase from the base period (c.w.e. or r.t.c.)



Source: OECD and FAO Secretariats.

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an inflexion point early in the outlook period. The steady recovery of Brazilian beef exports will be due to an expansion of domestic output, better compliance to sanitary import regulations, and sustained import demand from the Middle East. India will benefit from an increasing consumer interest in buffalo meat and will rank as the fourth largest exporter of beef by 2021.

Aggregate growth on pigmeat trade will be relatively modest during the outlook period, but some changes in the composition of trade are to be 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. Exports from Brazil, which until recently were expanding rapidly, will slow down as a result of an increase in domestic consumption and the recurrence of sanitary import restrictions. Net trade in China, where half of the world's pigmeat is produced and consumed, is not expected to change during the outlook period. In China, 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, supporting R&D and the scaling up of production facilities. Export growth from the European Union will stagnate as producers adapt their farms to new animal housing regulation to be enforced from 2013.

In poultry, a significant slowing down of annual trade growth is anticipated, from an annual rate of 5.5% in last decade to less than 2% during the outlook period. During the first part of the projection, exports will stagnate due to high poultry meat prices. Nevertheless, the adaptation of production to higher feed and energy costs is expected to induce structural and technological changes in the industry, boosting productivity, production and export growth during the second half of the projection period, when annual growth rates are expected to accelerate once again. The largest contributors to growth are the United States and Brazil, both of which will strengthen their dominance of world trade. By 2021, the United States and Brazil will generate nearly 80% of the expansion of world poultry trade.

World poultry import growth will be led by countries in the Middle East, Southeast Asia and Latin America. Purchases by Russia, once the world's largest importer, will progressively decline following higher domestic production. Equally so, imports by the European Union will stagnate from a larger availability of domestic produce as the industry quickly adapts to the EU Directive which banned the use of conventional battery cages from 2012.

Sheepmeat exports from New Zealand and Australia will gain momentum through the Outlook period, as farmers expand their production from enlarged flocks. Firm prices are sustained by a growing demand from increasing export volume which is projected to reach over 499 Kt c.w.e by 2021. Export demand will stem from traditional markets but also developing market such as China, Saudi Arabia, Jordan, United Arab Emirates and Qatar in response to income growth.

Main issues and uncertainties

A number of key market drivers and macroeconomic events could alter the meat market projections of this Outlook. The key issue will be the feed market situation, and the factors that will affect its evolution over the outlook period (Chapter 4). Given the sensitivity of the meat sector to macroeconomic conditions, any disturbance over the outlook period, particularly but not exclusively in emerging developing countries, could have a large impact.

The Russian Federation has traditionally been a top meat importer, but in recent years the pigmeat and poultry sectors have experienced sustained growth. This Outlook assumes that this trend will continue, albeit reduced, during the outlook period, with the Russian Federation achieving a higher degree of self-sufficiency and some exportable surpluses. However, if accession to the WTO does not occur as assumed, trade will be reduced even more than projected. China's net trade position *vis-à-vis* pigmeat is also 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 the potential to severely impact international markets. In North Africa and the Middle East, large importers of sheepmeat, poultry and beef, changes in oil prices, or as recently experienced the fallout from civil unrest, have the potential to impact world meat trade.

A certain number of animal diseases have the potential to affect domestic and regional meat production. Although the eradication of some has proved technically possible, it has also proved to be expensive. Countries and regions are therefore protective of their disease-free status and make strenuous efforts to sustain this situation. Foot and Mouth disease (FMD) is a case in point.

In addition to affecting domestic production, some animal disease outbreaks have also caused radical and lasting effects on trade. The world market for beef, for example, has for decades been divided into FMD-free trade routes (the "Pacific" market) and the rest of the world (the "Atlantic" market). The relatively recent episode of BSE (year 2004) is an example of the severity of the impact on world meat trade when the country affected is a large exporter. Disease outbreaks of zoonotic scope, such as H1N1, also loom as potential factors that could impact significantly not only across meat markets, but also on consumer behaviour.

The world meat market is also highly fragmented by country-specific legislation on food safety, and import restrictions pose a significant risk to the validity of the projections. For example, in May 2011, the Russian Federation imposed sanitary restrictions on meat imports from a number of Brazilian states. The ban resulted in a substantial contraction of bilateral trade on beef and pigmeat, and the end of two years of (almost) uninterrupted monthly increases of world meat prices. These projections assume that no import bans with significant and long-lasting effects on trade will occur during the outlook period.

Finally, environmental costs are rising for the production of virtually all meats, and novel legislation that conditions production to environmental protection may affect the growth of the sector. The livestock sector is considered by analysts and policy makers as a key contributor to anthropogenic greenhouse gas (GHG) emissions. As world population and income growth expand the demand for livestock products, these emissions are expected to increase. It remains uncertain the extent to which livestock production may be subject to carbon mitigation constraints over the next decade.

Box 7.1. Productivity change in the meat sector

Meat production has grown about 300% in the past 50 years, and as noted in this *Outlook*, is anticipated to be one of the fastest growing commodities, due largely to growing incomes and the westernisation of diets in many emerging economies. At the same time, livestock capital – the number of bovine, porcine, poultry and ovine animals has grown, at 57%, 137%, 400% and 49%, respectively. The change in “off-take”, or the quantity of meat produced per animal, in inventory has therefore increased substantially over time. This means that fewer animals are required to achieve a given level of meat production. This partial productivity measure captures a number of changing characteristics in the meat sector including, the number of offspring per breeding animal, length of feeding period, and of course, the yield of meat for each animal slaughtered. Ultimately, higher off-take ratios imply a lower inventory of animal number or capital which is required to produce meat, and has considerable resource implications. Table 7.1 provides selected country examples of off-take ratios for different meats, recent trends, and projected future growth rates over the next decade.

Off-take ratios by country and by animal type may vary for a number of reasons. Meat production characteristics vary by animal and by country depending on pasture and arable land availability, social norms and the state of development. Large differences in off-take ratios can be observed, particularly noting that intensive operations normally indicated higher off-take ratios than less intensive ones. Grain-fed operations typically show higher off-take ratios, as animals may be slaughtered at a younger age and at higher weights. In the main, off-take ratios appear much lower in developing countries, particularly for bovine meat. Ratios appear very low for African countries, where growth rates are also much lower. Often, animals are kept for other reasons than simply meat production, such as for providing a source of wealth or, in the case of sheep, fibre such as wool. Historical growth in off-take ratios has been high for a number of emerging countries, particularly Brazil and China (and India and the Russian Federation for pigmeat). As these countries increase their meat production, higher off-take ratios will be important in controlling the size of their animal inventories and associated problems.


Estimated trend projections provided in Table 7.1 generally indicate that the rate of partial productivity growth is slowing in most countries. It should be noted that this lower growth is from a higher base. In general, except for many African countries, the gaps in off-take ratios have been converging to some degree, although not rapidly. There would appear to be substantial scope for increasing this measure of productivity in many countries, offering the potential to limit the growth of animal numbers over the long term, and minimise resource and environmental costs associated with larger numbers.

Box 7.1. Productivity change in the meat sector (cont.)

Table 7.1. Trends in meat off-take ratios in selected countries

	Bovine meat			Pigmeat			Poultry meat			Sheepmeat		
	Offtake ratio	Growth	Projected	Offtake ratio	Growth	Projected	Offtake ratio	Growth	Projected	Offtake ratio	Growth	Projected
	2005-09	1985-2011	2012-21	2005-09	1985-2011	2012-21	2005-9	1985-2011	2012-21	2005-09	1985-2011	2012-21
	kg/hd	%/yr	%/yr	kg/hd	%/yr	%/yr	kg/hd	%/yr	%/yr	kg/hd	%/yr	%/yr
Algeria	75	1.4	0.8	22	0.5	0.3	2	-0.6	-0.3	8	1.5	0.9
Argentina	60	0.5	0.3	122	4.2	2.3	14	4.6	2.5	3	0.7	0.4
Australia	158	1.3	0.7	144	1.2	0.7	9	1.4	0.8	1	3.2	1.8
Brazil	45	2.5	1.5	83	5.3	3.2	9	4.4	2.7	3	-1.5	-0.9
Canada	126	0.1	0.0	174	2.0	1.1	7	0.7	0.4	19	0.9	0.5
China	55	8.5	4.9	108	3.0	1.7	3	3.2	1.8	13	5.3	3.0
E27	91	0.1	0.0	144	1.0	0.7	8	0.5	0.3	10	-0.7	-0.4
Egypt	77	1.5	0.8	46	-6.5	-3.4	6	1.6	0.9	7	-4.1	-2.2
India	8	0.4	0.2	39	0.3	0.2	4	7.5	4.2	4	0.1	0.0
Indonesia	24	0.6	0.3	93	1.4	0.8	1	0.8	0.5	5	-0.3	-0.2
Japan	133	-0.3	-0.2	130	-0.2	-0.1	13	1.8	1.1	6	0.8	-
Malaysia	15	0.0	-0.1	101	0.5	0.3	5	0.1	0.1	1	1.3	0.6
Nigeria	15	-0.4	-0.3	31	-0.6	-0.4	1	0.3	0.2	8	3.0	1.7
Russia	80	-2.7	-1.7	122	3.2	2.0	5	8.4	5.2	9	-1.6	-1.0
South Africa	57	1.1	0.5	139	2.9	1.5	7.7	0.1	0.0	4.5	0.2	0.1
Tanzania	14	0.0	0.0	33	0.7	0.4	2	1.8	1.0	3	-0.2	-0.1
Thailand	37	1.2	0.6	108	1.4	0.7	5	-1.0	-0.6	4	-1.2	-0.6
United States	120	0.8	0.5	153	0.9	0.5	8	1.4	0.8	10	-1.5	-0.8
World	42	0.3	0.3	111	1.5	1.2	4.6	1.2	0.8	5.0	2.3	2.3

Note: Off-take ratios are computed as gross indigenous meat production divided by all animal inventories. Trend growth rates are computed from trend regression over the period indicated, but shorter in where data are limited. Growth estimates for E-27 and world are limited to the period from 1996, the Russian Federation from 1992. Source: OECD and FAO Secretariats.

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