

## MEAT

### Market situation

Overall world meat production increased by only 1% to 317 million tonnes in 2016, with growth in the Americas and Europe offset by a down-turn in output in China in particular, but also in Australia. This was the second lowest annual increase in the last decade. Among the various sectors, poultry and bovine meat production expanded, while a decline was evident in pigmeat and sheepmeat production.

Measured by the FAO Meat Price Index, prices began 2016 at low levels, equivalent to those last seen at the end of 2009, and despite some recovery during the course of the year, annual average prices compare to levels attained in 2010, well below recent peaks. Prices rose for all categories of meat, in particular ovine, pig and poultry meat, with bovine meat recording more modest growth. Limited supplies of pigmeat in the European Union and of sheepmeat from Oceania lent support to prices for these products, while firm international demand, in particular from Asia, underpinned poultry meat prices. Meanwhile, recovery in bovine meat production in the United States reduced import requirements, contributing to a smaller lower increase in international prices for this product than for other categories of meat.

Global meat trade recovered in 2016, rising by 5% to 30 Mt. This represents a return to trend levels following the decline in 2015. Trade increased for pigmeat by 9%, poultry meat by 5%, and bovine meat by 3%, while sheepmeat decreased by 3%. At the country level, China in particular increased its imports of meat, along with Chile, Korea, Mexico, the European Union, the Philippines, South Africa, and the United Arab Emirates. By contrast, growth in domestic production reduced imports by the United States and Canada. Australia, the Russian Federation and Angola also imported less. The expansion in world meat exports was led by Brazil and the European Union, followed by the United States, with sales also rising for Argentina, Canada, Mexico, New Zealand, Paraguay and Thailand. Meanwhile, exports by Australia, China, India, South Africa and Turkey fell.

### Projection highlights

The outlook for the meat market remains relatively favourable for producers. Feed grain prices have declined and assuming stable weather are set to remain low for the projection period. This lends stability to a sector that had been operating in an environment of particularly high and volatile feed costs over extended periods through the past decade. This is particularly relevant for regions such as the Americas, Australia and Europe, where feed grains are being used more intensively in the production of meat.

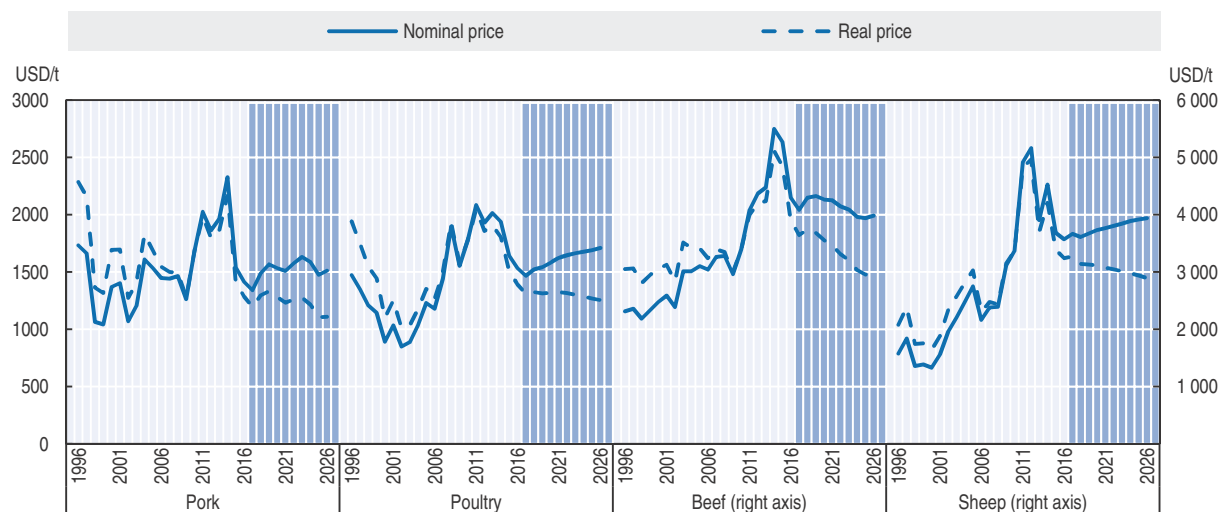
Global meat production is projected to be 13% higher in 2026 relative to the base period (2014-16). This compares with an increase of almost 20% in the previous decade. Developing countries are projected to account for the vast majority of the total increase, with a more intensive use of feed in the production process. Poultry meat is the primary driver of the growth in total meat production in response to expanding global demand for this more affordable animal protein compared to red meats. Low production costs and lower product prices have contributed to making poultry the meat of choice both for producers and consumers in developing countries. In the bovine meat sector, cow herds

are being rebuilt in several major producing regions, but the decline in cattle slaughter in these regions is projected to be offset by higher carcass weights. Production is further increased by rising slaughter numbers in countries that are further along in the rebuilding cycle. This resulted in slightly higher beef production starting in 2016. Production growth is expected to accelerate from 2017 onwards, as slaughter volumes continue to increase. Piguement production will also increase after 2017, driven by slow herd expansion in China. The increase in herd size is, however, slowed by increased environmental regulations and animal welfare concerns affecting the pork sector. Production is also expected to increase in the sheepmeat sector with an expected global growth of 2.0% p.a., a higher rate than last decade. Production increases will be led by China, with expansion also in Algeria, Australia, Bangladesh, Islamic Republic of Iran, Nigeria, Pakistan and Sudan.

Globally, the traded share of meat output is expected to remain fairly constant, at around 10%, over the projection period, with most of the increase in volume coming from poultry meat. Import demand growth will be weak during the first years of the outlook period, mainly due to lower imports from China and the Russian Federation. Import demand will strengthen in the second half of the projection period, due to import growth in the developing world. The most significant growth in import demand originates from the Philippines and Viet Nam as well as Sub-Saharan Africa, which captures a large share of additional imports for all meat types. Although developed countries are still expected to account for slightly more than half of global meat exports by 2026, their share decreases steadily relative to the base period. On the other hand, the share of the two largest meat exporting countries, Brazil and the United States, in global meat exports is expected to increase to around 44%, contributing to almost 70% of the expected increase in global meat exports over the projection period.

At the start of the outlook, nominal meat prices are expected to be at levels similar or lower to those registered in 2016. Meat prices are projected to trend only marginally upwards as the market expands and exerts downward pressure on prices. Despite normal cycles for meats with longer production cycles, e.g. beef and sheepmeat, nominal prices for all meats are projected to be higher in 2026 relative to current levels. By 2026, the price for beef is projected to increase to USD 3984/t carcass weight equivalent (c.w.e.) and to increase to USD 3938/t c.w.e. for sheepmeat, while world pigmeat and poultry prices are expected to rise to around USD 1500/t c.w.e. and USD 1 709/t product weight (p.w.) respectively. Poultry meat demand is expected to increase more rapidly than the demand for pigmeat. In real terms, prices are expected to trend downwards for all meat types (Figure 3.4), although meat-to-feed price margins will generally remain within historical trends.

Global meat consumption per capita is expected to stagnate at 34.6 kg retail weight equivalent (r.w.e.) by 2026, an increase of less than half a kg r.w.e. compared to the base period. Nonetheless given high population growth rates in much of the developing world, total consumption is still expected to increase by nearly 1.5% per annum. Additional per capita consumption will consist mainly of poultry while pigmeat will decline globally on a per capita basis. In absolute terms, total consumption growth in developed countries over the projection period is expected to be approximately a fifth of that in developing regions, where rapid population growth and urbanisation remain the core drivers. These drivers are particularly important in Sub-Saharan Africa, where the rate of total consumption growth over the outlook period is faster than any other region. The composition growth is also different, with beef accounting for most of the total growth. Import demand is also expected to continue increasing in South East Asia.

Figure 3.4. **World meat prices**

Note: US Choice steers, 1 100-1 300 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: Export unit value for chicken (f.o.b.) product weight.

Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

1 2 <http://dx.doi.org/10.1787/888933522073>

Globally, animal disease outbreaks and trade policies remain among the main factors driving the evolution and dynamics in world meat markets. The implementation of various trade agreements, such as the ratified China-Australia Free Trade Agreement (ChAFTA), or the signed Canada-Ukraine Free Trade Agreement (CUFTA) and the Comprehensive Economic and Trade Agreement (CETA) over the outlook period could increase and diversify meat trade. Domestic policies will also impact the meat sector such as the review in 2018 of the US Farm Bill. Further factors that could impact the meat outlook include consumer preferences and attitudes towards meat consumption. Consumers are showing a preference for free-range meat and antibiotic-free meat products, but the extent to which they are willing and able to pay a premium for them remains unclear.

**The expanded meat chapter is available at**  
[http://dx.doi.org/10.1787/agr\\_outlook-2017-10-en](http://dx.doi.org/10.1787/agr_outlook-2017-10-en)

## MEAT

### Prices

Despite rising during the second half of 2016, meat prices have declined from recent peaks, in both nominal and real terms. During the projection period, prices reflect a marginally increasing trend in nominal terms due to moderate economic growth, but a downward trend in real terms. The actual path will differ depending on the type of meat.

Nominal bovine meat prices will decline until 2025 in line with an expansion of output in key producing areas of the world. However, increases in feed costs will slow the rate of expansion of the beef cow herd and, in turn, production growth.

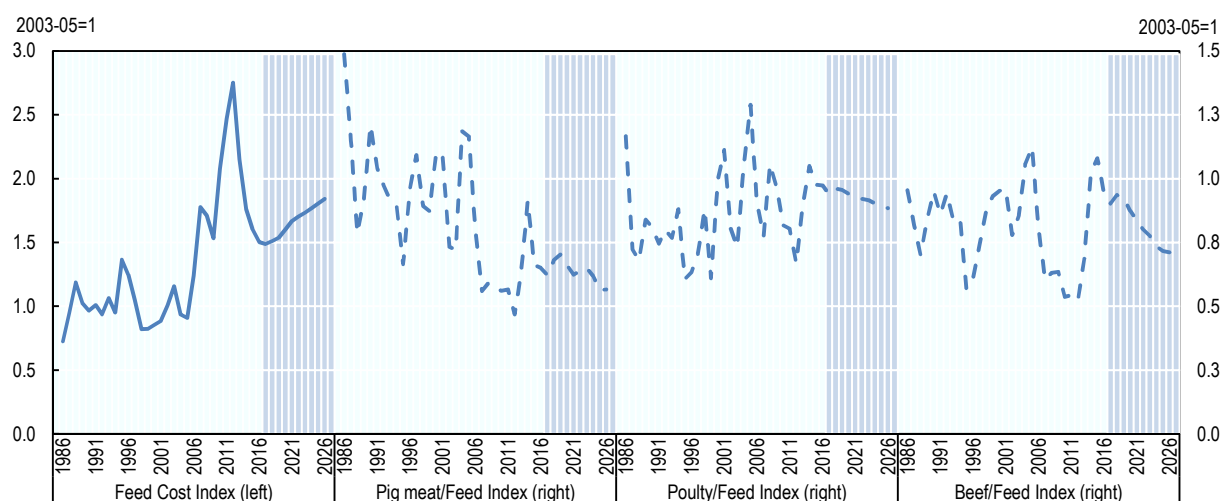
Nominal pigmeat prices will slightly increase from 2017 levels, implying a modest decline in real terms. Notable features of the global sector that shape this trend are increased supply from North America, the People's Republic of China (hereafter "China") and Brazil, and higher imports from Korea, Mexico and Viet Nam.

In poultry, a combination of demand growth, particularly from Asia, gradually rising feed costs and substitution in favour of poultry and away from other meat types induces a marginal increase in nominal poultry prices, while prices in real terms will decline slightly throughout the projection.

Nominal sheepmeat prices are expected to increase only marginally, due partly to weaker import demand from China and the Middle East combined with a gradual increase in lamb production in Australia, Nigeria and Pakistan. In New Zealand, the continued expansion of the dairy herd is not expected to allow sheep numbers to grow substantially over the outlook period. After several years of decline the European Union production is set to stabilize at current level with an expected return in profitability and implementation of voluntary coupled support.

In the early part of the projection, production will benefit somewhat from positive meat-to-feed price margins as well as better feed conversion ratios. Increased productivity will also lead to a supply-driven market that will moderate price increases over the projection period. Poultry meat remains the primary driver of the growth in total meat production, mainly in response to expanding global demand in the developing world in particular Asia. Low production costs, high feed conversion ratios, and low product prices have contributed to making poultry the meat of choice, both for producers and consumers.

Figure 3.4.1. Feed cost index and meat to feed price ratios



Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-data-en>.

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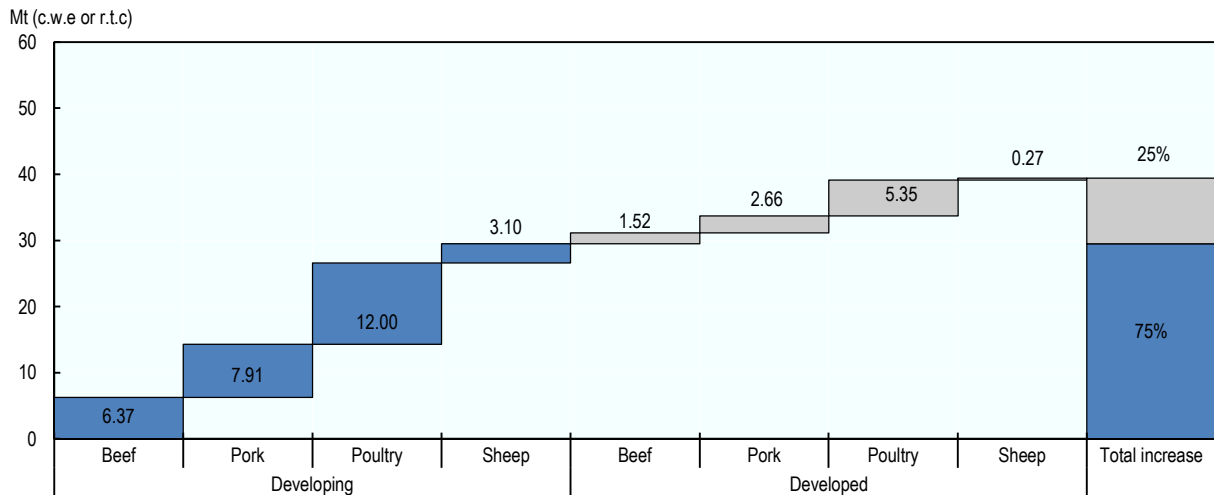
**Production**

Livestock supply responses to market signals continue to be influenced by environmental and food safety regulations, in addition to the availability of natural resources, and technical and technological opportunities for productivity gains. As such, there is potential for production growth in many developing countries where natural grasslands and agricultural land abound for producing feed grains, e.g. South America or in Sub-Saharan Africa.

Total meat production is projected to expand by slightly more than 39 Mt by 2026 reaching nearly 353 Mt. This development predominantly occurs in developing countries which will account for approximately 75% of the additional output (Figure 3.4.2). From 2016 onwards, poultry production is projected to surpass that of pigmeat.

Meat production continues to be dominated by Brazil, China, the European Union and the United States though output growth from these producers is expected to marginally decelerate over the outlook period (Figure 3.4.3). Brazil’s production growth will benefit from an abundant supply of natural resources, feed and grassland availability, productivity gains, and to some extent the devaluation of the Real. China’s production will benefit mostly from growing economies of scale as small production units grow into larger, increasingly commercial enterprises. Other developing countries with noteworthy potential contributions to additional meat production include Argentina, India, Indonesia, Mexico, Pakistan and Viet Nam (Figure 3.4.4).

**Figure 3.4.2. Growth of meat production by region and meat type**  
2026 vs 2014-16



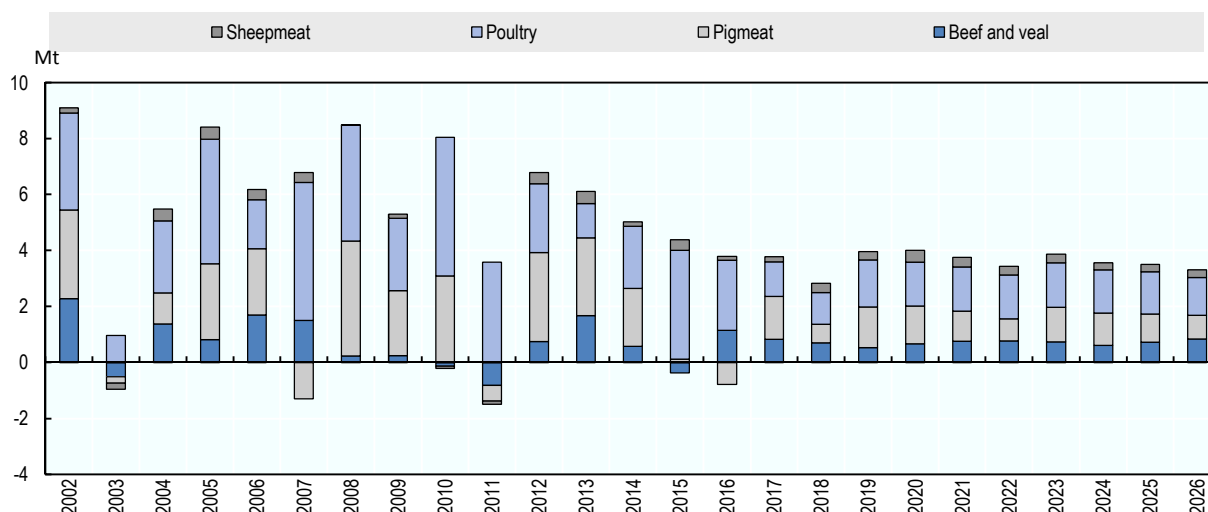
Note: c.w.e. is carcass weight equivalent, r.t.c. is ready to cook equivalent.

Source: OECD/FAO (2017), “OECD-FAO Agricultural Outlook”, *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-data-en>.

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**Figure 3.4.3. Annual growth of meat production by type**

Year over year volume change

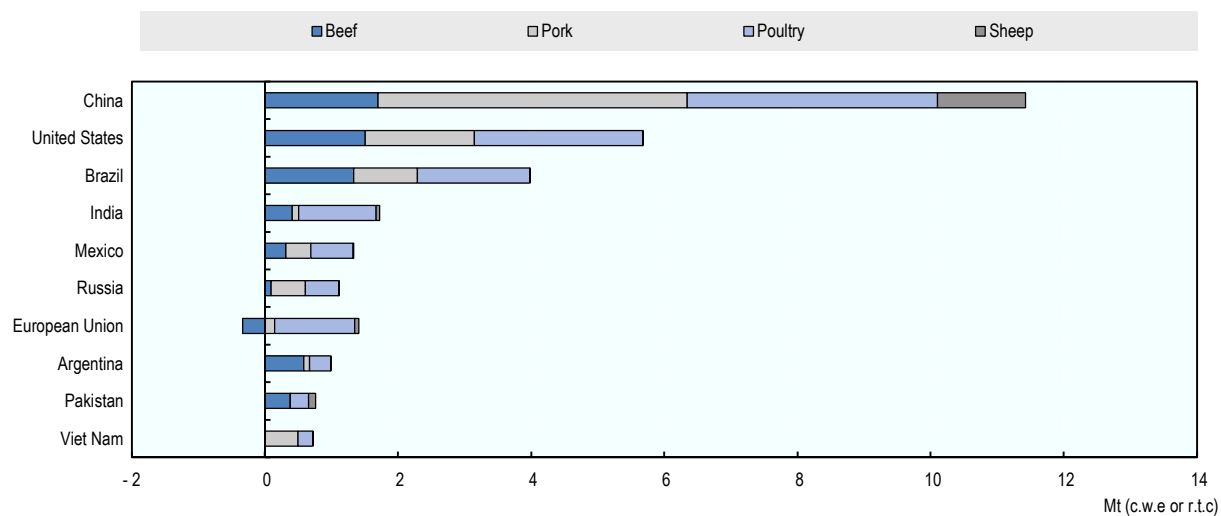


Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-data-en>.

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**Figure 3.4.4. Countries with the greatest share of additional meat production by meat type**

2026 vs. 2014-16



Note: c.w.e. is carcass weight equivalent, r.t.c. is ready to cook equivalent.

Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-data-en>.

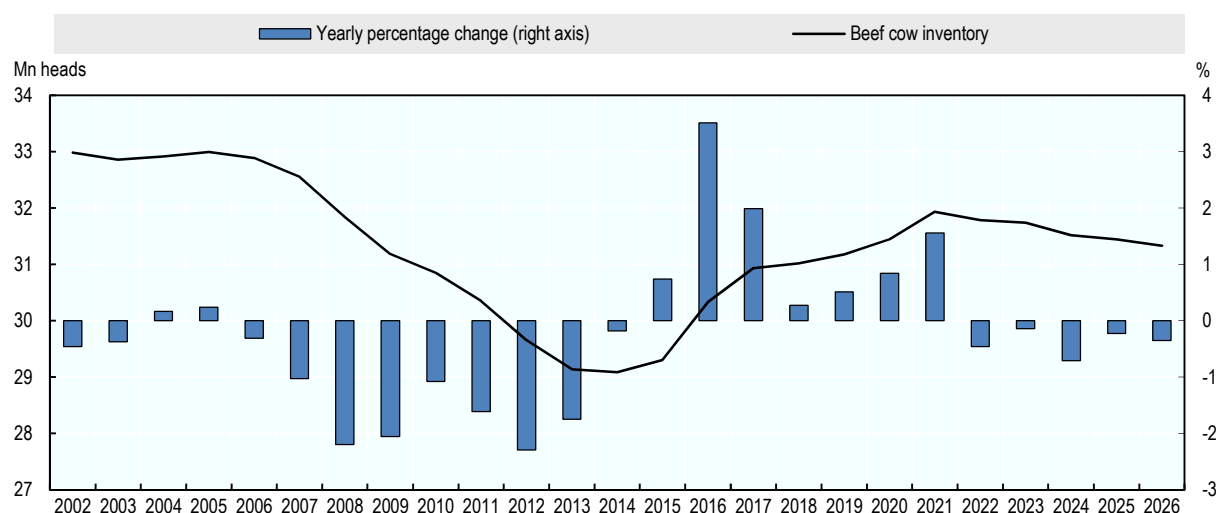
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Beef production in developing countries will be 16% higher in 2026, relative to the base period and account for 80% of the additional beef produced. As much as 75% of this additional beef production is attributed to Argentina, China, Brazil, India, Mexico and Pakistan. In India, most of this increase is derived from growth in dairy production. In developed countries, production will be 5% higher by 2026 compared to the base period, virtually all due to high growth in the United States. New Zealand and Europe, where the dairy breeds make up approximately two third, of the bovine meat supply, will decrease beef production mainly due to productivity gains in the milk sector, thereby limiting the beef production potential, and lower demand. In the long term, it is expected that the dairy herd will expand in North-Western Europe, where grass is abundant while beef cow herds should stabilize in region which have opted for the voluntary coupled support for beef.

Australia, Brazil and the North America have started a cattle herd rebuilding process, which is projected to continue into the early years of the outlook period. This follows from an extended period of cow herd liquidation due to drought conditions and reduced profitability during a period of high feed costs. For the *Outlook* period, production continues to grow across the main producing countries. In the short term, production will be supported by higher carcass weights arising from low feed costs. But also increased slaughter numbers as the herd rebuilding from the past two years starts to become evident in higher livestock numbers.

In the United States, for example, total beef cows will increase up to 2021, but a number of indicators suggests that the rate of expansion will slow over the outlook period. Indicators include a decline in domestic per capita beef consumption after 2021, and little increase in the share of production that is exported. Declining profitability indicators in the latter part of the next decade underpins the projection that the US cow herd will enter a declining cycle from 2022 onwards. (Figure 3.4.5.).

Figure 3.4.5. US beef cow inventory



Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-data-en>.

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The expansion in global pork production will decelerate over the next decade. China will rebound from the 2016 decline in production and provide 44%, or 4.6 Mt, of the additional global output. The total global volume will remain in line with the demand recovery, which is significantly lower relative to the past decade. China's pig herd declined over the past four years, mainly attributed to the implementation of China's Environment Protection Act which restricts pig production in the south of China<sup>1</sup> while favouring the transfer of pig production to northern China. Strong production growth rates over the outlook period are also expected in Brazil, Mexico, the Philippines, the Russian Federation, the United States, and Viet Nam. Foreseen strong import demand from China will support a marginal growth in production in the European Union despite a saturated domestic market.

Poultry will continue to strengthen its dominant position within the meat complex, accounting for nearly 45% of all additional meats that will be produced over the next decade. Its short production cycle allows producers to respond quickly to market signals, while also allowing for rapid improvements in genetics, animal health, and feeding practices. Production will expand rapidly in countries that produce surplus feed grains, such as Brazil, Mexico, the

Russian Federation, Ukraine, the United States and the European Union, particularly Hungary, Poland and Romania which are investing in the sector. There is also rapid expansion in Asia led by China, India, Indonesia, the Islamic Republic of Iran, Malaysia, Pakistan, Thailand and Viet Nam.

Sheepmeat production will experience a high rate of growth, with developing countries accounting for the bulk of the additional output. China, the leading sheepmeat-producing country, will contribute 40% of additional production. Australia and New Zealand's global share of sheepmeat production is expected to marginally decline throughout the outlook period, with a sheep flock projected to stabilise in New Zealand and gradually be rebuilt in Australia. The Sub Saharan Africa region's share of sheepmeat production will slowly increase and contribute 23% of the additional global production.

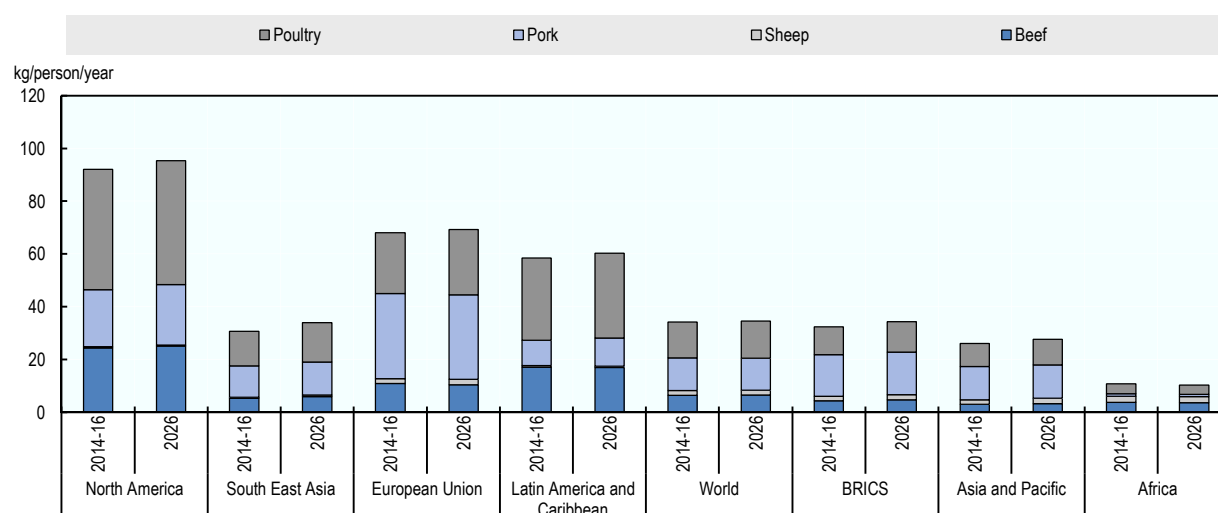
### Consumption

In much of the developing world, per capita meat consumption declined in 2016 as income growth slowed, particularly in regions highly dependent on commodity exports. Although growth in the demand for meats is expected to recover over the outlook period, particularly in the developing world, they are generally expected to be at lower rates than in the past decade. Growth will stem mostly from income and population growth, especially in countries with large middle classes in Asia, Latin America, and the Middle East. In developed countries where consumption level are already high, meat demand continues to increase, particularly in the United States, but at rates generally lower than those in developing countries, where population growth is typically higher (Figure 3.4.6).

In the least developed countries with high population growth rates, meat consumption has been growing rapidly, albeit from a low base. This is notably the case in Sub Saharan Africa where beef accounts for the bulk of additional consumption in the region, followed by poultry. Whereas the bulk of the beef consumption is produced within the SSA region, half of the additional poultry will be imported.

Beef consumption will gradually increase over the next ten years. By 2026, and relative to the base period, it is expected to increase by almost 6% in developed countries, whereas in developing regions it is expected to increase by approximately 17%. In per capita terms, beef consumption in the developing world remains low relative to developed countries, at about one-third in volume terms. High population numbers in Asia remains a major driver of growth, combined with the positive perception of Chinese buyers' that bovine and ovine meat are healthier and disease-free; the result is an expected 44% increase in beef consumed in Asia over the next decade.

Figure 3.4.6. Per capita meat consumption by country and region



Note: c.w.e. is carcass weight equivalent, r.t.c. is ready to cook equivalent.

Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-data-en>.

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Pigmeat consumption on a per capita basis declines marginally over the outlook period with consumption in most developed countries reaching saturation levels. Within developing countries, significant regional differences are



evident in per capita pigmeat consumption. Growth is sustained in Argentina, Brazil, Mexico, and Uruguay, albeit at a generally slower rate than the past decade. Pigmeat consumption has grown rapidly over the past few years in Latin America, fuelled by increased domestic production, improved quality, and favourable relative prices that have positioned pork as one of the favoured meats, along with poultry. Conversely, many countries with favourable economic conditions and expanding meat consumption do not traditionally consume high levels of pork relative to other meats, resulting in stagnant and even declining consumption on a per capita basis at the regional level. Population expansion still supports growth in total pork consumption in these regions.

Consumption of poultry meat increases regardless of region or income level. Per capita consumption will grow, even in the developed world, but growth rates will remain slightly higher in developing regions. Worldwide, poultry grew rapidly and surpassed pigmeat as the preferred animal protein in 2016. This will remain the case during the outlook period and, of all the additional meat consumed over the next decade, poultry is expected to account for almost 45%.

Sheepmeat consumption worldwide on a per capita basis will reach 2.1 kg r.w.e. by 2026. In Latin America sheepmeat consumption per capita is expected to remain stagnant. In contrast, sheepmeat will continue to expand in several countries, such as China and those where the population traditionally consumes sheepmeat, such as the Middle East, given the expansion of their middle classes and population in general.

### Trade

At the global level, meat exports are projected to be 14% higher in 2026 than in the base period. This represents a slowing down of trade growth to an annual average rate of 1.4% compared to 3.4% during the previous decade. However, the share of total output traded on the global market will remain similar in 2026 to the base period. In the developing world, a rising share of meat consumption will be imported over the outlook period. Imports will increase, particularly for poultry and bovine meat which will account for 85% of the additional meat traded in 2026. Asia will account for the greatest share of additional imports, notably China, Korea, the Philippines and Viet Nam. At present, meat imports into Southeast Asia account for 10% of global trade, but rapid growth in imports will expand this import rate to 12% by 2026. The bulk of this growth will accrue to Viet Nam and the Philippines (Figure 3.4.7). For some products, such as poultry, higher demand will be partly met by increased local trade while increased beef demand will be met by an expanding and increasingly diverse supplier base. Poultry will constitute 40% of this additional import demand from the South East Asia region.

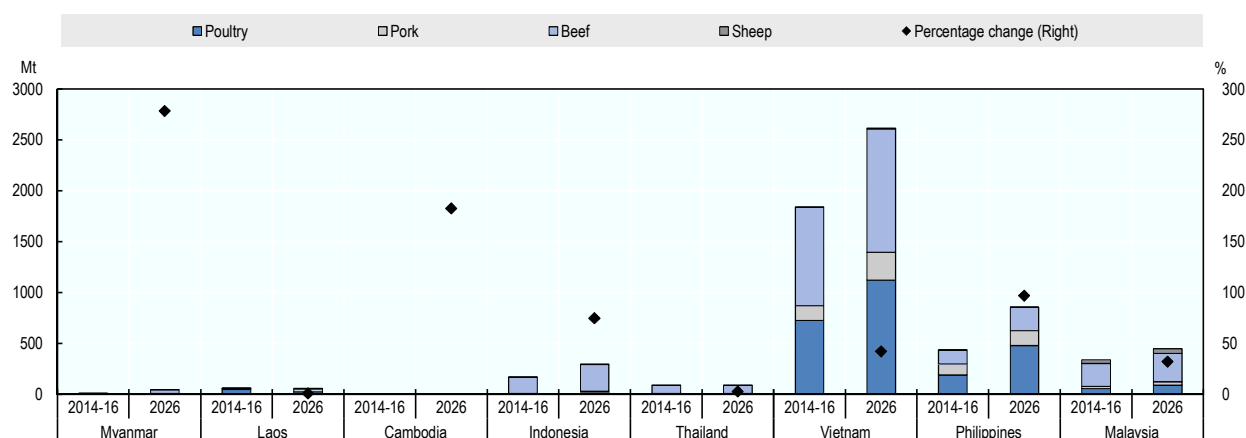
Although by 2026 developed countries are expected to account for slightly more than half of global meat exports, their share will decrease steadily relative to the base period. Meat exports will become increasingly concentrated, with Brazil expected to capture more than a third of total trade expansion and the United States more than a quarter. Exports from the European Union will grow at a much slower rate. The European Union has improved its access to Asian markets, but competition from North and South America will prevent it from taking full advantage of this opportunity. In developing regions, traditional exporting countries are expected to retain a high share of the global meat trade. Brazil and Argentina, will somewhat benefit from the depreciation of their currencies.

The highest import demand in 2016 was from China. For the outlook period, meat import demand will be weaker mainly due to lower pigmeat imports from China. This will partly be offset by strengthening imports of beef from Sub Saharan African and Asia Pacific countries. For the projection period, China's increase in meat production will not be enough to meet national demand, which implies it will need to continue importing at high levels. Viet Nam will capture a large share of additional imports for all meat types, supported by favourable economic growth. Africa is another fast growing importing region, though many countries start from a low base.

Global import growth in volume is driven by poultry meat, the bulk of which is imported by developing countries. The vast majority of additional growth in bovine meat will be traded between developing countries. However, developed countries will supply the bulk of additional trade on pigmeat, which will go almost entirely to the developing world. In other words, while bovine meat trade growth occurs increasingly among developing countries, growth in pigmeat remains mostly within developed countries.

Brazil has increased its pigmeat exports to the Russian Federation, which imposed import bans on certain traditional suppliers, and which is expected to be sustained in the medium term. It is also anticipated that Brazil will benefit from strong poultry demand from the developing world where diets are continuously diversifying towards higher animal protein consumption levels. Brazil's poultry sector is highly competitive, and their products can compete in urban areas of the developing world with domestic producers. Over the outlook period Brazil will overtake the United States as the main poultry exporting country.

Figure 3.4.7. Meat imports in selected South East Asia countries



Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-data-en>.

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Australia and New Zealand will continue to lead global sheepmeat markets as the middle class in China and the Middle East continues to expand. Australia is expected to increase lamb production at the expense of mutton. In New Zealand, export growth will be slow, as land use shifts from sheep farming to dairy.

### Main issues and uncertainties

Trade policies remain a major factor impacting the dynamics of world meat markets. As a result, the projection and implementation of various trade agreements over the outlook period could diversify or consolidate meat trade considerably. Multilateral trade agreements are proving difficult to ratify, which may favour bilateral trade agreements. Despite the ratification of various trade agreements, technical requirements can influence the ability to trade, making it difficult to determine a systematic international perspective on which standards to use.

Unilateral and/or unexpected trade policy decisions are another risk factor in the projections. For example, in 2014 the Russian Federation imposed an import ban on foods imported from the United States, Australia, Norway, Canada and the European Union in response to economic sanctions. Domestic policies also influence the competitiveness of meat producers. Investment in infrastructure, such as the Northern Australia beef road programme, will improve the resilience of the cattle supply chain and help to reduce the amount of food loss.

An important factor that could impact the outlook relates to sanitary and food safety concerns arising from animal diseases outbreaks. The Russian Federation, for example, imposed a ban on pork imports originating from the European Union following an outbreak of African Swine Fever (ASF) in Eastern Europe. They also closed their market to pigmeat in retaliation to the European Union's economic sanctions (expected to end in 2017). Likewise, the outbreak of Avian Influenza in Europe, the United States as well as in China has the potential to influence traded volumes. Depending on the duration, intensity, potential consumer reactions, and trade restrictions, these bans could impact domestic and regional meat production, consumption and trade.

Environmental and animal health regulations as well as regulated animal movement, trade and cross-border traffic (Box 3.4.1) may affect the growth of the livestock sector as this may imply higher costs of compliance by affecting the location of production or through specific requirements related to animal housing or waste disposal. The livestock sector is also considered a key contributor to anthropogenic greenhouse gas (GHG) emissions. As the world population and income growth increase the demand for livestock products, these emissions will likely increase. It remains uncertain, though plausible, that in the medium to long term some countries may impose carbon mitigation constraints in livestock production. It is also estimated that around 20% of meat is wasted globally and that consumers in the developed world could reduce their meat calories by using alternative sources of protein. Such a change would contribute to reducing GHG emissions. The nature of consumption is also changing and the future competitiveness of the meat industry could rest on adding more value to animal products and responding to consumers concerns on health issues.

### Box 3.4.1 International Collaboration for Animal Health and Safer Trade

The Southeast Asian region is characterised by favourable economic growth and rapid urbanisation, leading to dietary diversification and growing demand for animal protein. The livestock sector has grown accordingly, with an increase in livestock numbers, production unit size, throughput, and specialization. Increasing political stability, policy liberalization and infrastructural improvements have also allowed this growth to become a driving force behind livestock trade and migration in the region. While positive, these factors have inadvertently created an environment more susceptible to animal disease outbreaks,<sup>1</sup> which can have significant economic, social and public health impacts. With outbreaks often linked to poorly regulated animal movement, trade and cross-border traffic of contaminated food products, an understanding of these processes is critical for prevention, detection, and risk management to ensure safer trade, sustained economic growth and food safety in the region.

Unregulated transboundary movement of livestock accounts for a substantial share of live animal trade and imposes additional risks of an epidemic expansion of Foot and Mouth Disease (FMD) in the region. Despite natural variations between countries and species, some typical trade patterns arise from price differentials. Swine (including suckling pigs) mostly originate in Viet Nam and reach Laos, Thailand, Malaysia and Cambodia. Myanmar imports mostly Nepalese and Indian buffaloes, as well as cattle from Bangladesh, and serves as a transit country of these animals on the way to Southeast Asia. Thailand is the largest importer of large ruminants from Myanmar, Cambodia and Laos. Rising demand for animal protein is also boosting the livestock trade between Southeast Asian countries and the Peoples Republic of China.

Based on the assumption that there will not be any substantial outbreaks of animal diseases over the course of the next decade and that production increases will continue to be moderated by the ongoing pressure of natural events, the Outlook foresees an increase in trade from both outside and within the region. Poultry imports are expected to increase in the countries of Southeast Asia by an annual average of 4.5%, implying an increase of about 49% in trade volumes by 2026 relative to 2016. Pork imports are expected to increase by an annual average of 5.3% to 2026, a total increase of 68%. Given that some part of the intraregional meat trade and transboundary animal movement in the region is informal, outbreaks of diseases could become more unpredictable and severe in the consequences.

Growing trade volumes and increasing livestock density carry with it greater risks of disease outbreaks and subsequent devastation of rural livelihoods dependent on livestock production. The livestock sector in Southeast Asia is in a state of transition. While it is becoming increasingly industrialised, smallholders still keep a significant share of total livestock, mostly in close proximity to humans and without specific sanitary precautions. This type of dual structure is expected to continue to co-exist as an integral part of the agro-ecological system in rural areas creating considerable risks for animal disease outbreaks in the region.

In the past, diseases outbreaks had severe economic consequence, threatening overall market stability and food security in Southeast Asia. Future events of such magnitude may have similar consequences. Therefore, there is no doubt that benefits of animal disease prevention and emergency response far outweigh the costs of such actions and are critical to the sustainable development of rural livelihoods. Currently, a wide networks of facilities operates in Southeast Asia and China for the control and prevention of transboundary disease and animal health crises. Collaboration between organisations, countries, and sectors, such as the four-way linking framework that brings together public health, laboratory, epidemiology, and veterinary services is critical to fight transboundary diseases effectively, limit risks of epidemics and consequently reduce variability of production and trade in future.

Specific joint activities in the region include: (1) establishing a formal collaboration and coordination platform to promote transboundary animal disease control; (2) promoting FMD-free production in select areas for safer trade and export; (3) strengthening capacities to address threats and losses due to swine diseases including PRRS and CSF and preparedness for diseases such as African swine fever (ASF); (4) supporting development of National Plans to prevent, detect and respond to the sheep and goat viral disease, peste des petits ruminants (PPR) in alignment with the FAO/OIE Global PPR Control and Eradication Programme; (5) using progressive control pathways to manage and reduce disease burden systematically to meet international guidelines; and (6) value-chain analysis particularly of live animal markets and their contribution to disease emergence and spread. Intra organisational collaboration between the Food and Agricultural Organisation of the United Nations (FAO), World Organisation for Animal Health (OIE), World Health Organization (WHO) and Association of Southeast Asian Nations (ASEAN) include programmes such as the South-East Asia and China foot-and-mouth disease (SEACFMD) campaign, and the emerging pandemic threats (EPT) funded by the United States Agency for International Development (USAID).

1. Diseases with significant economic, social or public health impacts in the region include Foot-and-mouth (FMD), Avian Influenza (AI), Rabies, Porcine Reproductive and Respiratory Syndrome (PRRS), Classical Swine Fever (CSF) and African Swine Fever (ASF).

#### Note

1. The Act contains provisions for increased financial penalties for livestock breeders that mismanage waste. Local authorities are using tougher environmental rules to close down or relocate pig farms, in particular those located close to densely populated areas. It is reported that more than half of small farms in Guangdong province were shut down while the remaining farms were requested to reduce their herds. A similar initiative exists in Fujian province (OECD 2016b).