

Global

Animal

Protein

Outlook

2020

***Seeking Opportunities
in an Uncertain World***

November 2019

RaboResearch
Food & Agribusiness



Rabobank

In 2020, global animal protein has many areas of uncertainty...

- **African swine fever (ASF)** overwhelms the outlook for 2020 – as it has done during 2019 – and will pull down overall growth, as well as bring uncertainty to all markets
- Many **trade disputes** and issues are causing uncertainty for global animal protein, with the US-China trade war the most apparent
- At present, **sustainability** is slightly less prominent than the above issues. However, in our view, it is just as important, as it will shape the growth of animal protein production and consumption through the 2020s

Global Animal Protein Outlook 2020: Our Takeaway Messages

...but there are also opportunities:

- The most obvious area of opportunity is **recovery from ASF**, which, in our view, will extend through the 2020s
- **Winning on sustainability** is another opportunity, which can be achieved by harnessing the supply chain and moving ahead of market signals
- Investing to **secure ongoing trade flows** can also be an opportunity, as this can reduce some of the uncertainty and secure continuous market access



Global Market Outlook: Growth Overtaken by African Swine Fever

North America

- We expect production for all species to rise in 2020 – led by pork, followed by poultry, and finally beef
- While domestic consumption will grow, exports will need to pick up to manage this production growth

Europe

- Poultry and pork production are set to rise, with pork growth driven by export opportunities
- Beef production is expected to decline in response to soft consumption

China

- ASF dominates the outlook, with a further decline in pork production in 2020
- Production will grow for all other species, given the pork shortage and prices at high levels

Southeast Asia

- ASF is expected to spread further in 2020
- Poultry production will again rise strongly in 2020, partly in response to ASF
- Beef production remains flat, but imports are on the rise

Brazil

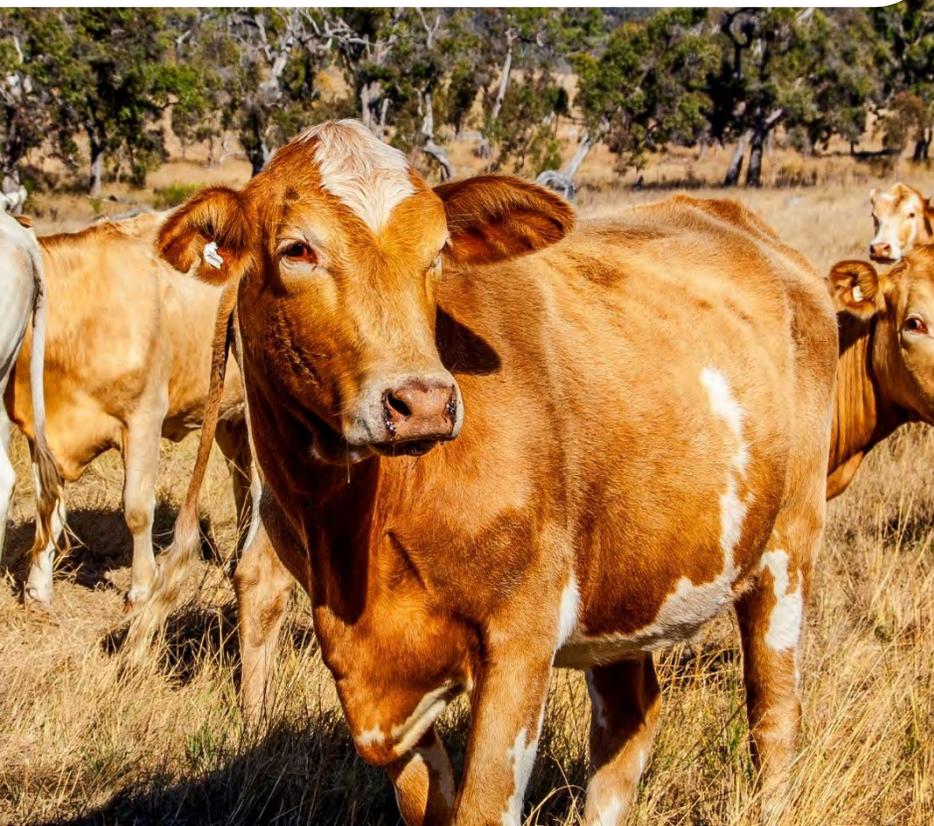
- Production growth is expected for all species in 2020
- Export opportunities are the main driver, although domestic demand is also improving

Australia & New Zealand

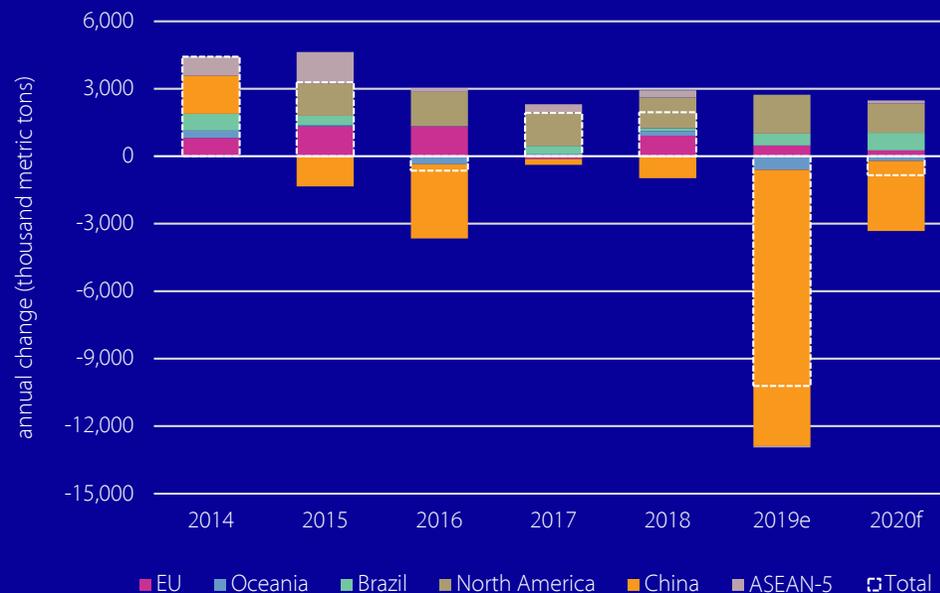
- Tight livestock inventories in Australia will see beef production down and sheepmeat production stable in 2020, with firm prices for both
- We expect New Zealand's beef and sheepmeat production to rise, with favorable price levels

Production Outlook for 2020 for Key Regions

We expect growth in most regions in 2020, but the impact of ASF in Asia overwhelms the outlook. In particular, China's production losses will exceed the growth in all other regions combined.



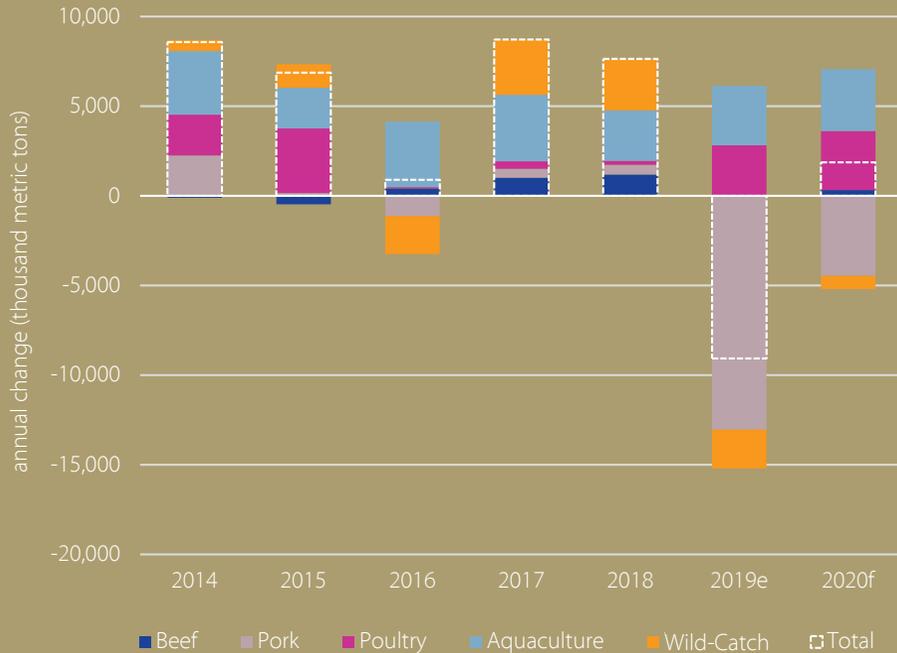
Total production will recover in 2020, but ASF losses means it will be a year of limited overall growth.



- 2020 growth forecasts for key regions will see overall production of beef, pork, and chicken recover from the strong losses in 2019
- However, the magnitude of losses in 2019 means 2020 production will be well below the 2014-18 average, prior to the major ASF outbreak
- Growth will be strongest in North America – led by pork and then chicken – and also in Brazil, where all species are expected to grow
- China is expecting another year of overall decline, due to the impacts of ASF on pork production

Source: USDA, OECD-FAO, European Commission, FIGIS, national sources, Rabobank 2019

The global picture is dominated by the pork production decline.



- We expect total production growth across terrestrial and aquatic species to be positive for the key regions – ASEAN-5, Brazil, China, EU-28, North America, and Oceania – in 2020, after a year of strong decline in 2019
- The decline in pork in 2020 – although less than recorded in 2019 – dominates the outlook. We expect ASF to continue to have an impact into the 2020s
- Aquaculture and poultry lead the growth again, given favorable markets and the substitution opportunity resulting from pork losses

Source: USDA, OECD-FAO, European Commission, FIGIS, national sources, Rabobank 2019



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Production Outlook for 2020 by Species

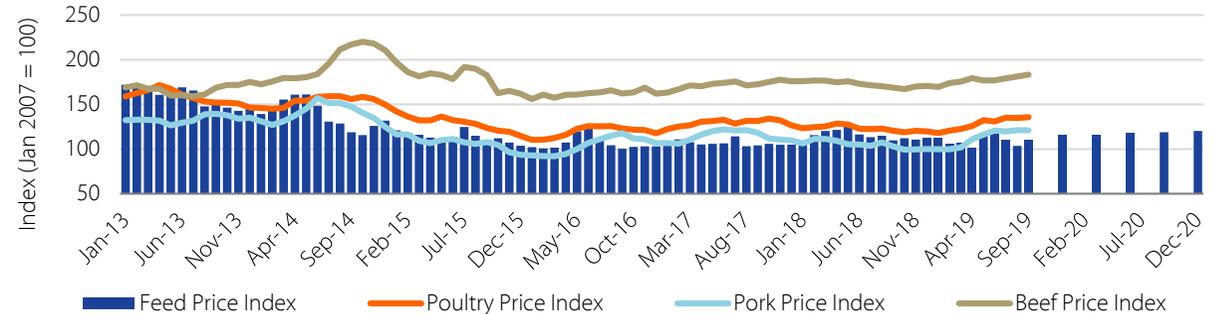
Aquaculture and poultry will lead production growth in 2020, while beef will be stable, and wild-catch seafood will decline again. All of these changes are minor compared with the production decline in pork.

Feed Prices Stabilize in 2020: A Good Year for Margins Awaits

Weather may create imbalances in certain regions, but overall, ample feed supplies will be available globally. Favorable conditions may raise the risk of overproduction.

- Global feed prices are expected to stay relatively neutral in 2020. Globally, there are ample supplies that should keep feed prices at reasonable levels
- Weather risks could create imbalances in certain regions
- For more information on our commodity outlook, please see the RaboResearch Agri Commodity Markets Outlook 2020

Rabobank's feed price monitor shows the prospect of good margins in 2020



North America: As demand for US corn exports drops for a second consecutive year, and given expected higher acreage next year, corn prices should stay below USD 4.00/bu. Lower soybean ending stocks for 2020, compared to 2019, are expected to support prices. We expect a higher acreage, but prices could remain low if the US-China trade war continues.



Brazil: Grain exports are expected to benefit from a strong US dollar, which reduces US competitiveness in international markets and increases demand for Brazilian corn. Soybean exports might be challenged if the US and China reach a trade agreement. In this case, Brazil may struggle to export extra supplies and would likely crush domestically, reducing local protein meal prices.

Europe: The harvest for wheat and barley is expected to be better than initially anticipated for 2019/20. Wheat is expected to rebound in animal feed inclusion rates, given ample supplies. However, feed prices will depend on imports of corn from Brazil and Ukraine, along with EU wheat exports.



China: As the impact of ASF continues to be felt in 2020, demand for feed grains will be lower than in 2018, but slightly higher than in 2019. Demand for feed will help prices recover, but not enough to offset the decline in 2019. Lower stocks for corn will add upward pressure to feed prices.

Australia: For a third year in a row, drought is impacting production and reducing exports. Domestic wheat prices have been trading well above global prices for two years, making it difficult for Australia to compete in global markets. Ongoing high Australian prices are likely to shift demand away from Australia to the US, Canada, the Black Sea Region, and Argentine-origin grain.

Key Animal Protein Markets in 2020

North America

Continued growth, led by pork

Brazil & Argentina

Another year of growth, driven by exports

Europe

Poultry and pork leading growth

China

Poultry and beef growth unable to compensate for pork losses

Southeast Asia

Pork decline leading to stronger poultry growth

Australia & New Zealand

Production stable or possibly in decline, but prices firm

Seafood

Easing demand, with lower supply growth



North American Beef Production Eases, With Consumption up Again

Beef production in North America is reaching a peak, with marginal growth expected in 2020. Beef exports remain important, as beef consumption is flat. Poultry leads overall consumption up in 2020.



- Consumption across the species is set for another year of trend growth
- After four years of consistent growth, North American beef production will ease in 2020. Exports should keep growing

Growing reliance on exports, as domestic markets fail to keep pace

The North American pork and poultry industries continue to grow, while beef production is reaching a peak.

Domestic demand remains good, but cannot sufficiently absorb the quantity of new product coming to market. Excess production will continue to weigh on North American prices, particularly in pork and chicken. Per capita consumption growth will moderate for all three proteins in 2020 – up by about 1% in the US – as economic conditions weaken and competition from export markets raises prices. The lack of domestic support will make export demand even more critical.

Slow growth in beef in 2020, with a premium on quality

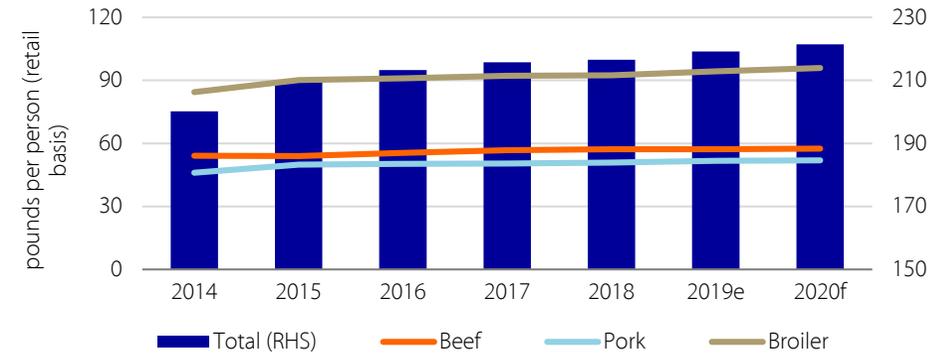
We expect US beef production to be up slightly, by less than 1% in 2020. Non-fed slaughter could also be up a little, as a result of liquidation. We expect the calf crop to come down slightly, reflecting weather conditions at calving and in spring. We expect carcass weights to return to trend, offsetting any reduction in numbers.

With only a fractional increase in production and solid exports, US fed cattle prices are expected to change little. We expect a spring high of USD 128/cwt to USD 130/cwt, and a summer low of USD 100/cwt to USD 105/cwt.

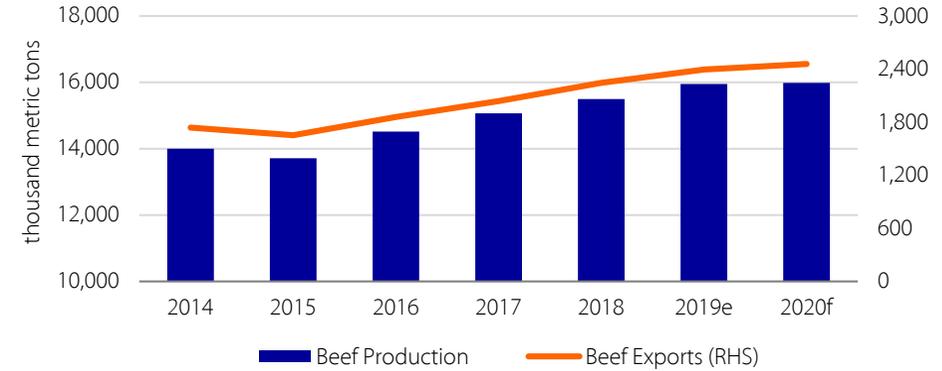
US domestic demand should remain strong, especially for high-quality product. Exports should be supported as trade issues are resolved.

Mexican beef production will be flat in 2020, given challenging seasonal conditions. Canadian production will also be flat, with lower calf numbers, but higher numbers of cattle on feed.

US per capita consumption looks set for another year of growth in 2020



North American beef production growth will slow in 2020, after four strong years





North American Pork and Poultry Production Will Outpace Exports

As pork and poultry production will increase again in 2020, and an economic slowdown could hamper domestic consumption, trade remains important for pork and poultry in North America.

- Productivity gains will exacerbate the US oversupply of pork and poultry, limiting domestic price improvement
- Improved access to critical markets in Mexico and Japan should allow for better prices for exports; the US remains focused on China trade terms
- Any slowdown in US economic growth could favor sales of poultry vs. beef and pork

North American pork growth slows, with the industry on high alert

Record 2019 pork production put a significant strain on markets and led to disappointing producer returns. While strong export growth was able to absorb much of the added supply, plentiful supplies of competing proteins and restrictive trade policies weighed on prices for much of the year.

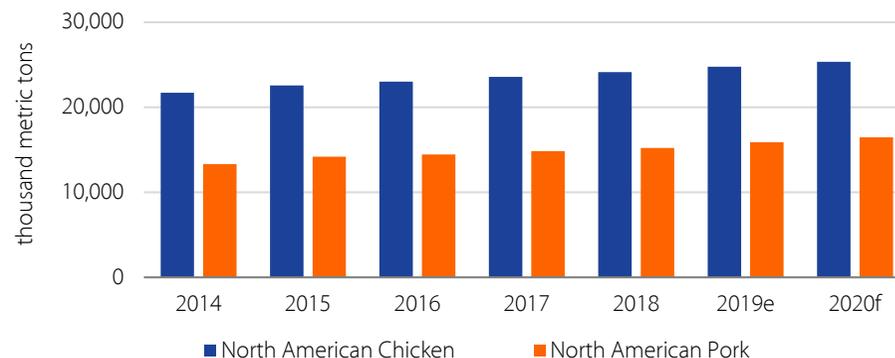
With production in the US and Mexico again expected to set new records in 2020 – up 4.6% and 4.1%, respectively – prices will continue to hinge on global pork demand. Concern over the global spread of ASF and the growing risk of trade disruptions will slow the pace of herd growth in 2020.

Poultry growth on pace for another record year of production

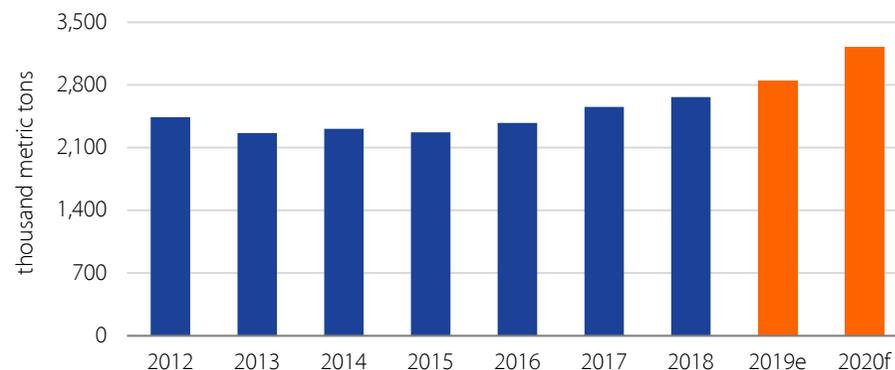
As new capacity becomes fully operational and productivity challenges are overcome, the US broiler industry will hit record production levels in 2020. Plentiful supplies are expected to weigh on markets for much of 2020, as record supplies of beef and pork will make any price improvement difficult.

Strong export demand – particularly to Asia, given ASF-driven shortfalls – will support dark meat values, as should normalized trade with Mexico. A recovery in Mexican broiler production, following the 2019 outbreak of avian influenza, will boost Mexican production, but should have limited impact on total volumes available.

The US and Mexico drive a 3.9% increase in pork production and a 2.6% gain in broiler production



US pork exports are expected to surge in 2020, as demand from Asia grows





Brazil and Argentina Grow Beef Production and Exports

Beef production is expected to rise in both Brazil and Argentina, with exports driving the gains.

- **Brazilian beef exports continue to rise for the fourth consecutive year**
- **The Argentine government projects a reduction of 400,000 head in 2020**

Brazilian beef production and exports will grow, and calf prices will soar

We expect beef production to rise by 3.5% in 2020, following a rise of about 2% in 2019. This represents strong continued growth over a four-year period.

According to official government data, the number of heifers slaughtered in 1H 2019 was a record for the period. The lower number of females is already impacting the price of replacement calves, which has risen 14% YOY in São Paulo state (Jan-Sep 2019).

Despite the reduction in exports to Hong Kong, Brazil's main beef destination in 2018, another export record is expected in 2020. This is because China has increased imports, which are expected to lift by another 10% in 2020. Brazil now has 32 export-approved plants for China.

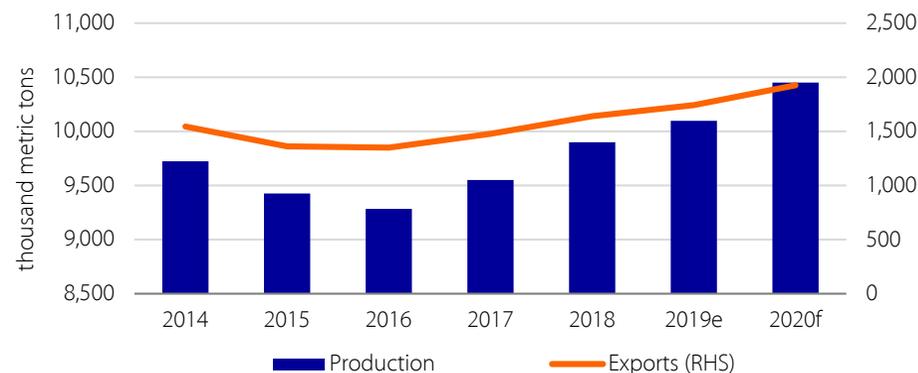
The Argentine beef industry is doing well, despite the economic crisis

The economic crisis has directly affected the Argentine beef sector. With an interest rate of around 80%, producers are without access to bank credit. As a result, slaughter has intensified, especially for females, to take advantage of strong Chinese export demand and attractive margins.

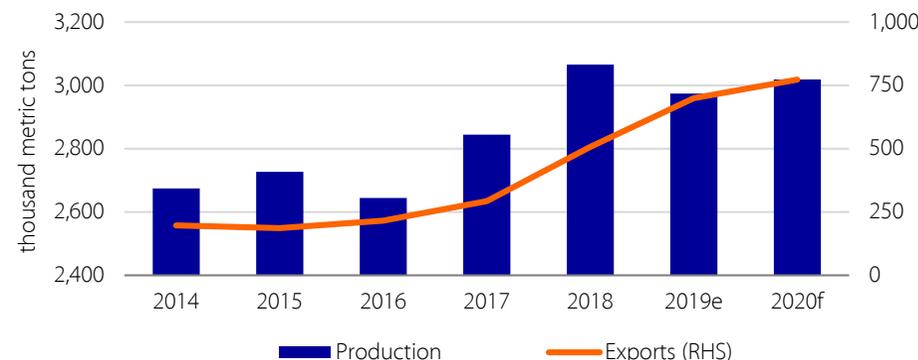
At the same time, domestic consumption is likely to decline for another year, as we expect local purchasing power to remain under pressure. The Central Bank of Argentina expects GDP for 2020 to decline by 1.5%.

Assuming no change in policy, Argentina is expected to increase beef exports by about 9% in 2020, with China accounting for roughly 70% of shipments.

Brazilian beef production and exports continue to rise in 2020



Argentine beef production and exports are expected to increase in 2020



Brazil's Pork and Poultry Production and Exports to Increase in 2020

After a year of strong demand in global markets, Brazilian pork and poultry production is expected to grow again in 2020, driven by exports.



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- We expect production to continue to rise for both species in 2020
- China should remain the largest Brazilian importer of pork and chicken

Pork and poultry production is set for further strong growth in 2020

Poultry production in Brazil is expected to rise in 2020, by 2% YOY. We see a recovery in exports as the main driver, although domestic consumption is also expected to rise.

Pork production in Brazil is also expected to increase in 2020, by 4% YOY, driven by strong demand in export markets, especially in China.

Consumption should improve locally, as the economic outlook strengthens

The economic outlook for Brazil has improved, with the Central Bank of Brazil expecting GDP to grow by 1.8% in 2020, resulting in higher consumer purchasing power, and an uptick in the domestic consumption of pork and poultry. The latest supermarket sales data showed a sales improvement of 3.4% YOY for 1H 2019, the strongest increase in the last five years, providing support for the positive outlook.

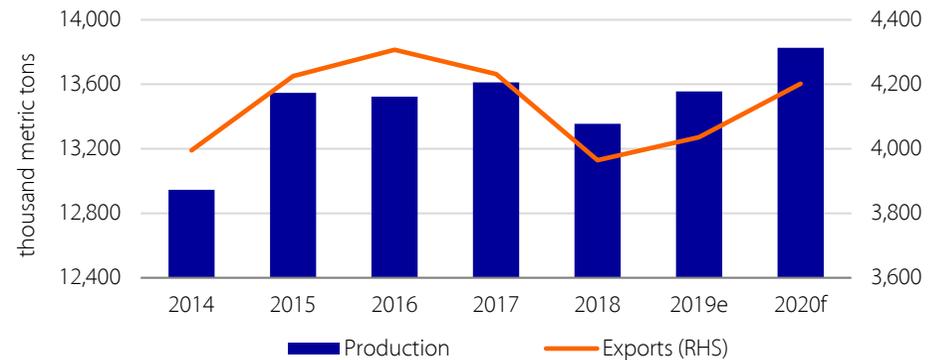
Our outlook on trade is for exports to improve

Brazilian poultry exports should continue the pace of 2019, with China now the largest importer, surpassing Saudi Arabia. Sales to Japan, which improved in 2019, should remain high, but below 2017 levels.

Brazilian pork exports are expected to remain strong in 2020. China now represents 30% of shipments and is the main destination for Brazilian pork. Export growth to China is facilitated by the approval of additional pork plants for shipments from September to November 2019.

After an embargo effectively halted Brazil's pork exports to Russia in 2018, this flow picked up again in 2019 – although Russia is much smaller than China in terms of what Brazil exports.

Brazilian poultry production and exports are expected to increase in 2020



Brazilian pork production and exports expected to record an uptick in 2020



Europe's Chicken Production and Exports Are Rising

Pork and poultry exports will rise again in 2020, after a strong performance in 2019. Poultry production is also expected to rise, despite a weaker performance in 2019.

- Pork exports to rise again, on strong Asian demand
- The poultry market will be supported by exports, given a strong supply position, but weaker profitability remains a challenge

Europe's exports remain important to overall performance in 2020

Pork exports should reach a new high in 2020, based on strong trade demand from China and other parts of Asia affected by ASF. While the direct beneficiaries are the plants (and storage facilities) holding export licenses, the effects will be felt across the market, as prices remain at high levels.

We expect EU poultry exports to grow strongly in 2019 and 2020 – by 4.5% and 4.2%, respectively – mainly driven by strong ongoing global demand for dark meat. This trend is linked to growth in demand in Africa and parts of Asia.

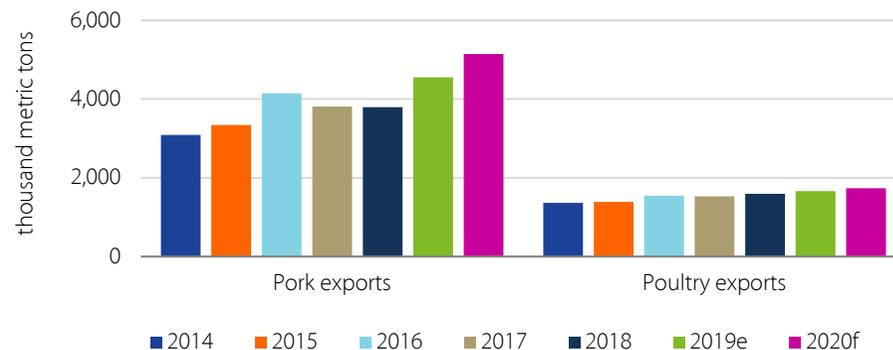
Beef exports remain important in balancing the market in Europe, but beef trade is challenged by restricted access to Turkey and rising high-quality beef imports.

European chicken: weaker performance slows down production expansion

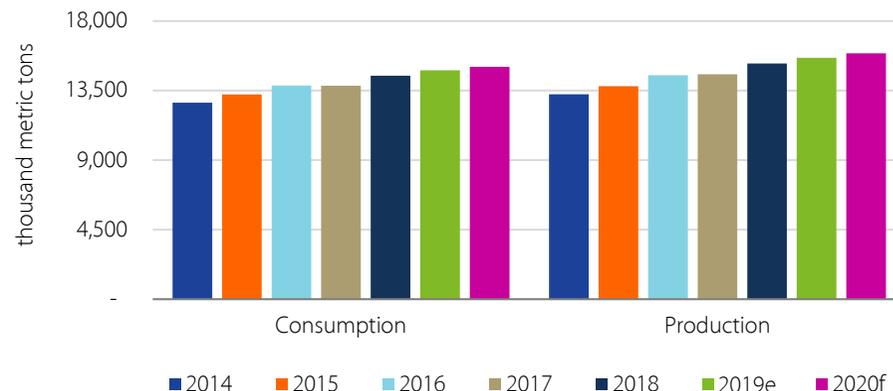
EU poultry has had a challenging 2019, and we do not expect a lot of upside in 2020. Key issues are the ongoing production growth (+2.5% expected in 2019), after exceptional growth of 4.8% in 2018. This situation is mainly caused by ongoing growth in eastern Europe, along with recent expansion in Spain. Increased local supply, together with recovering imports from Brazil, has challenged the market situation, especially for breast meat.

For 2020, the key challenge will lie in rebalancing markets. Strong demand for dark meat products on international markets does not compensate for the ongoing weak demand for breast meat. Therefore, the EU industry will need a more disciplined approach to supply growth in 2020, with production growth below 2%.

EU pork and chicken exports are expected to rise in 2020, after a strong 2019



Production growth slowing in EU chicken



Pork and Beef Consumption to Soften in Europe

Pork and beef production will move in opposite directions in 2020, with pork up slightly and beef down. Product-processing will remain the focus of value-adding for pork and beef.

- The pig herd is being challenged – by ASF in affected countries, and by social and environmental constraints in northwestern Europe
- The European beef sector sees ample supply, relative to demand

High pork prices support optimism, but not for all

As ASF sweeps through Asia, we expect pork export demand to remain strong in 2020. Despite the strength of exports, we expect a modest supply response in Europe, with production up by 1.25% in 2020, after a marginal increase in 2019. This muted response will keep prices elevated in Europe in 2020.

The ASF situation in eastern Europe is a source of uncertainty for production. In addition, environmental policies, especially regarding manure management, are pressuring herds in Germany and the Netherlands, home to 24% of the total EU sow herd. Production expansion in Spain continues, but may slow slightly in 2020. The integrated approach in Spain is more responsive to market conditions and may serve as a model for closer supply chain integration in other countries.

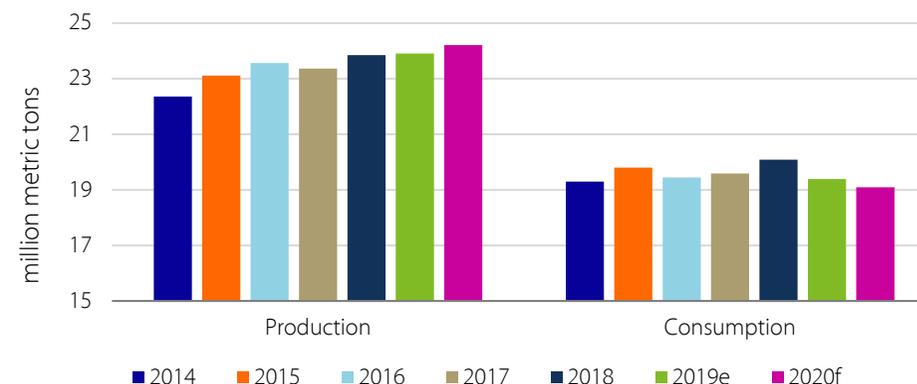
Beef production remains under pressure

Beef production has been under pressure in 2019 from low margins, which have pushed the market back into the slow decline seen before 2015. We expect similar conditions in 2020, but with scope for margins to improve.

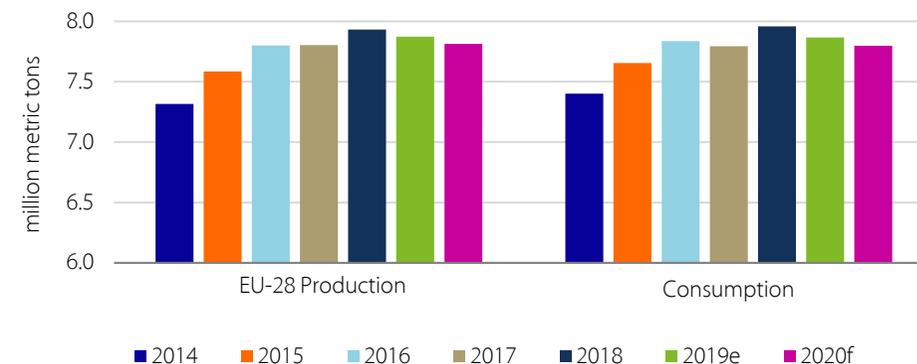
Margins along the chain have been affected by several factors. These include reduced forage and increased feeding costs, low poultry prices, environmental policy driving up costs for operations in northwestern Europe, ongoing restrictions on exports to Turkey, and a structurally lower British pound, in the EU's major domestic import market.

New export opportunities with Asian countries will be a positive for beef exporters in 2020. However, consumption is expected to return to the long-term trend of slow decline, encouraging processors to increase their focus on value-adding.

Pork production to increase slightly in 2020, given strong export demand



Beef production and consumption will return to declining trends in 2020



China's Pork Production Will Decline Further in 2020

ASF continues to be the largest threat to China's pork chain. Although restocking will likely lead to herd stabilization, pork meat production will continue to decline in 2020.

- ASF continues to impact pork production
- We expect pork production to drop further in 2020
- Chinese pork imports are likely to set a new record in 2020

Restocking will take off, amid concerns of disease infection

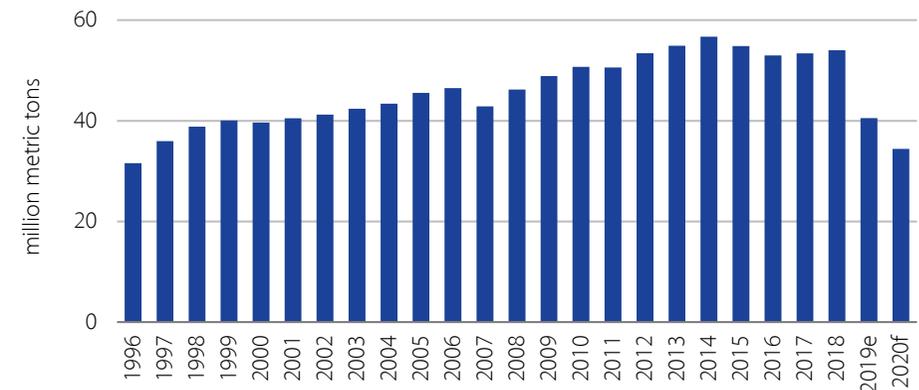
ASF has already resulted in the loss of more than half of China's hog herd in 2019. As a result, pork prices in Q4 2019 are more than twice as high as in the same period in 2018. The disease will continue to spread in China in 2020, and Rabobank expects pork production to decline further, by 10% to 15% from 2019 levels, given the low inventory of sows and the ongoing impact of the disease.

Restocking is expected to begin in earnest in 2020, even though the risks of re-infection remain high. Many farmers – especially large-scale farming companies – have ambitious plans to restock or invest in new farms. Some started restocking herds in previously infected farms in 2019, and while many have failed, some have succeeded. China's government has laid out guidelines to encourage production, which provide a basis for regional governments to implement their own policies to boost local production. Driven by soaring hog prices and favorable policies, we expect investments in restocking and new farms to surge from 2020 onwards.

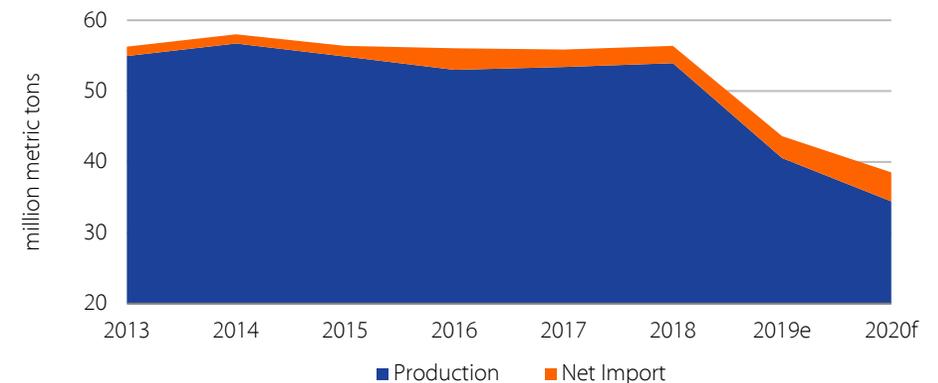
We expect to see a slight recovery of the hog inventory in 2H 2020, driven by investments during the year.

Pork imports will likely reach record levels in 2020. Given the high prices in China, the EU, Brazil, and Canada are expected to increase pork shipments to China in 2020. In addition, the tone in US-China trade talks suggests that China is willing to substantially increase pork imports from the US, subject to a broader agreement. But pork trade is full of uncertainty, given rising demands from other parts of Asia where ASF has hit local production, and given the impact of politics on trade.

China's pork production is expected to decline 10% to 15% in 2020



China's pork imports are likely to reach a record high in 2020





China's Poultry Production Is Up, With Beef Imports Also Increasing

Poultry production will increase rapidly, responding to strong demand, with imports also expected to grow. Beef production will grow steadily, with strong growth in imports boosting availability.

- We expect production to increase across all poultry species, driven by pork substitution opportunities
- Beef imports will continue to grow, despite the rapid growth in 2019

Poultry production and imports to increase, at different rates

Poultry production has grown rapidly in 2019, including white-feathered birds, yellow-feathered birds, spent layers, hybrid birds, and water fowls, which have all seen their output increase faster than in recent years. The breeding stock inventory of white-feathered birds has improved greatly, due to the steady growth of imports in 2018 and 2019. This suggests that white-feathered bird production may see even stronger growth in 2020 and 2021. We expect total poultry production to grow by more than 10% YOY in 2020.

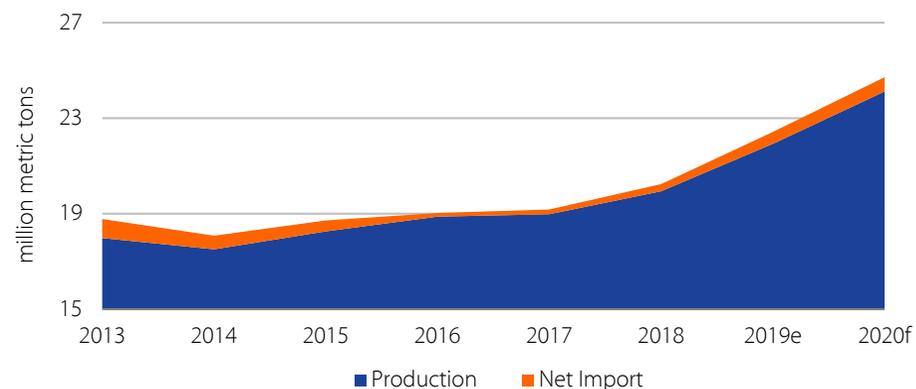
Poultry imports increased by 51% in the first nine months of 2019. We expect this momentum to continue into 2020, driven by ongoing strong demand, as the gap in total Chinese animal protein supply may grow wider in 2020.

Beef production will grow slightly, with imports growing in 2020

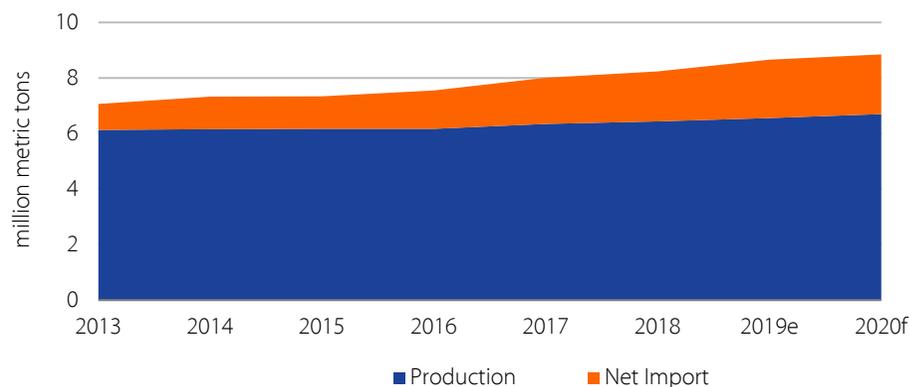
Beef production will likely grow at about 2% to 3% YOY in 2020, which is slightly faster than in 2019 – although this is still modest compared with poultry. Beef cattle farmers could not respond quickly to the pork supply issue in 2019, due to the long lifecycle of cattle. In addition, beef prices are already too high for beef to substitute for pork. However, we expect a stronger beef production response in 2020, as the price difference between beef and pork narrows, which attracts middle- and high-income households to beef consumption.

Due to the higher production costs in China, compared with other countries, China will need to increase imports to meet the strong demand. Beef imports increased by 54% in the first nine months of 2019, and the strong growth in imports will likely continue into 2020.

Poultry supply increases sharply, driven by strong demand



Beef imports will continue their strong growth of recent years in 2020



Southeast Asian Pork Shortage to Accelerate the Shift to Poultry

More investments to expand poultry and aquaculture production are expected in 2020, to offset the growing pork shortage.

- ASF to extend pork shortages in Vietnam and the Philippines, while Thailand and Malaysia are at risk of contagion
- We expect more vertical integration for the pork sector in Vietnam, and increased poultry output in Thailand and Indonesia

Supply shortage is likely to further boost hog prices

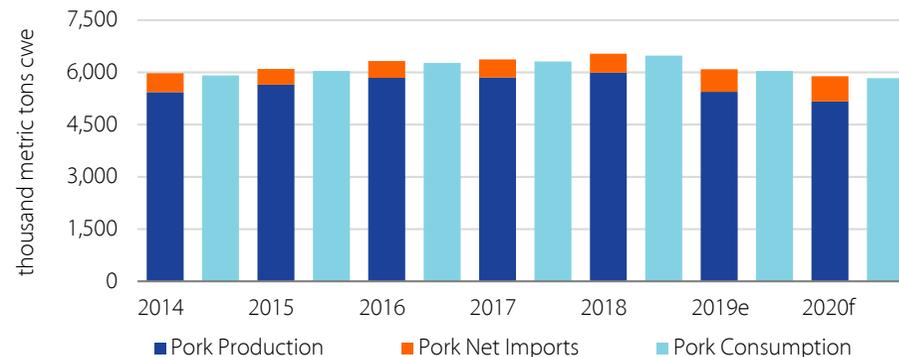
Driven by sow losses in Vietnam and the Philippines, Rabobank's current view is that ASEAN-5 pork production in 2020 will decline 5% YOY, to 5.2mmt, adding to an estimated 9% decline in 2019 due to losses from ASF outbreaks, with downside risks. Restocking efforts in Vietnam will remain slow due to recontamination risks, the existing debt burden of affected household farms, and limited production capacity of large biosecure farms. This underlying shortage is expected to keep prices elevated well beyond the peak demand season in early 2020. Higher hog prices, which affect fresh meat supply for the domestic market, should reduce ASEAN-5 pork consumption by 3% in 2020, to 5.84mmt (having declined by 7% in 2019), while boosting frozen pork imports 11% YOY, to 722,000mt

More investment in additional capacity is expected

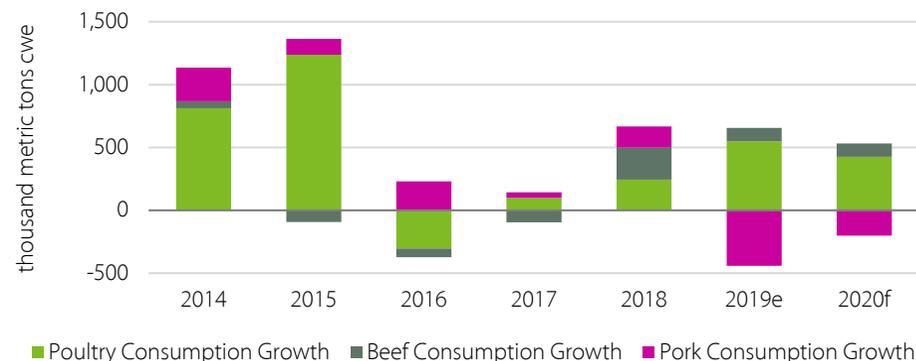
In addition to Vietnam and the Philippines, ASF may spread further in Laos, Cambodia, and Myanmar, via various vectors, given proximity to known outbreaks and probable unreported cases. We anticipate shifts in household farm production, from pork toward poultry and aquaculture. Large-scale corporate farmers are also expected to increase investments to expand capacity through large biosecure farms, and also to increase vertical integration to ensure food safety and strengthen their supply chains.

While Malaysia and Indonesia are also at risk of ASF, its potential impact would be less pronounced in these countries than in Vietnam or the Philippines, given pork's small share of consumption. In Thailand, current overcapacity in pork should slow any demand shift into poultry, although higher broiler costs could erode export margins.

ASEAN-5 pork consumption to drop from 2019, despite higher imports



Consumption shift from pork to poultry in ASEAN-5 may become visible in 2020





Southeast Asian Beef Prices Will Rise, On Chinese Demand

ASF will structurally shift protein production toward poultry, increasing imports and prices.

- ASEAN-5 beef demand will grow 4% YOY in 2020, outstripping production growth of 1% and requiring 6% more imports
- Poultry and aquaculture will benefit, with the shift in consumption becoming visible during 2020

Beef production will rebound, with higher prices

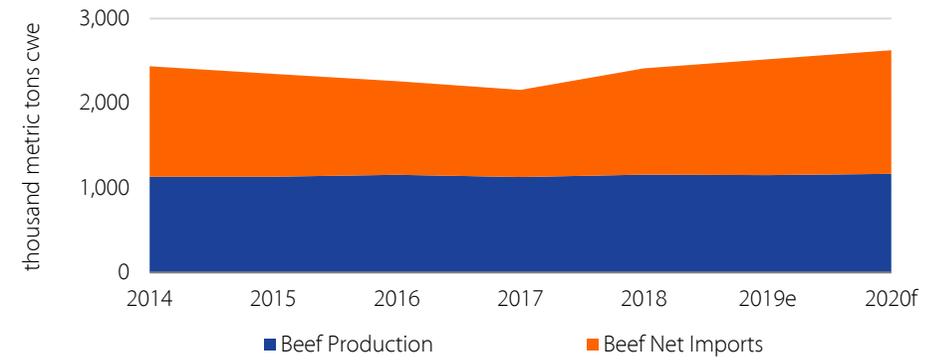
ASEAN-5 beef import dependence will expand to 50% of consumption in 2020, from 49% in 2019 – despite a 1.3% rise in 2020 production, to 1.48mmt. Indonesia remains the largest market and will see the biggest imports, followed by Vietnam and the Philippines. Herd-rebuilding in Australia and increased demand from China – resulting from a combination of ASF impact and a shift in origination policy – remain our base-case scenario. Higher expected feeder cattle prices in Brazil should keep Indian carabeef imports competitive for ASEAN-5 and provide some incentive for Indonesia to ratify IA-CEPA.

Demand shift toward poultry and seafood will pick up in 2020

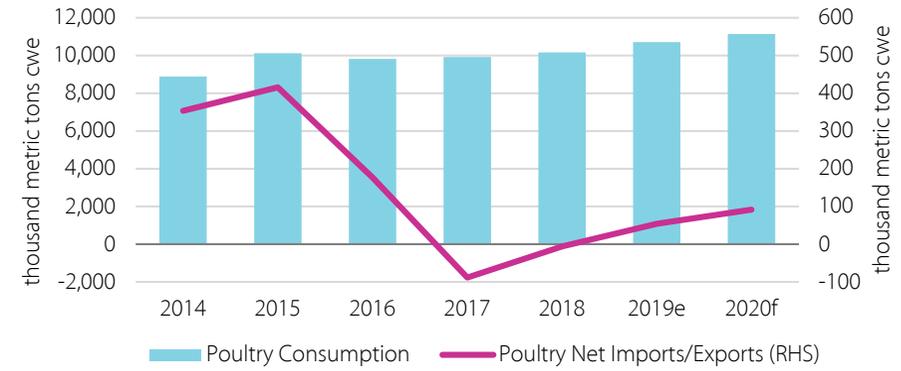
Higher pork prices in Vietnam, the Philippines, and other parts of Southeast Asia will gradually shift consumption to more affordable proteins. Demand has not meaningfully shifted toward poultry and seafood in Vietnam in 2019, but we expect to see this pick up in 2020 – along with higher pork prices. We expect the same to happen in other countries, such as the Philippines and Thailand. Investments in additional poultry farms and aquaculture capacity may be needed in the following years, as demand builds.

In 2020, ASEAN-5 poultry production is forecast to expand by 4.0%, to reach 9.69mmt. This is up from 3.8% in 2019, given increased exports from Thailand and higher production in Indonesia, offset by higher imports into Vietnam. The average cost of imported and domestic raw feed materials in 2020 should be slightly higher in Indonesia, Thailand, and the Philippines – taking into account domestic offtake policies and potential damage as a result of armyworm (for corn).

Rising beef imports (ex. feeder cattle) in ASEAN-5 are driven by Indonesia



ASEAN-5 turned net poultry importer again from 2019, driven by Vietnam



Source: OECD-FAO, USDA, FAOSTAT, General Statistics Office of Vietnam, UN Comtrade, Rabobank 2019

In Australia, Low Livestock Numbers Will Limit Production

The lowest cattle inventory in over 20 years will limit exports and keep prices strong. The sheep market also expects strong prices, on the back of steady production and strong exports.



- Continuing dry conditions forced further liquidation of stock through 2019, reducing inventories to their lowest levels in over 20 years
- Low stock numbers and improved seasonal conditions will lead to lower slaughter, production and exports in 2020
- Demand from global markets will continue to support prices in 2020, and any improvement in seasonal conditions will generate significant upside for livestock prices

Cattle market sees limited cattle availability and strong price upside potential

With high female slaughter in 2019, Rabobank expects breeding cow numbers to have been heavily reduced – and as a result, 2020 slaughter and production will be lower. In addition, any improvement in seasonal conditions will ignite producer restocking demand and further limit stock available for slaughter – challenging abattoirs and feedlots to maintain throughput. More limited cow slaughter and any improvement in seasonal conditions will increase slaughter weights and reduce exports of lean trimmings.

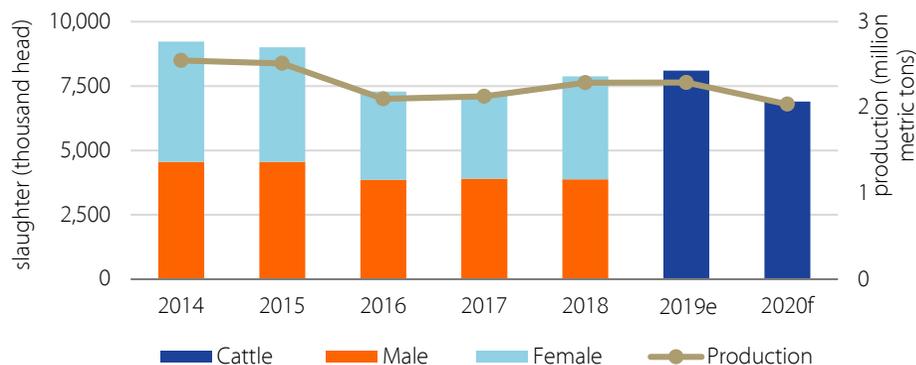
Lower inventory numbers and strong global markets will continue to support livestock prices – in particular heavy finished cattle – through 2020. If seasons improve, there is considerable upside for all cattle prices, especially young replacement stock.

Sheep market will be characterized by steady production, with strong prices

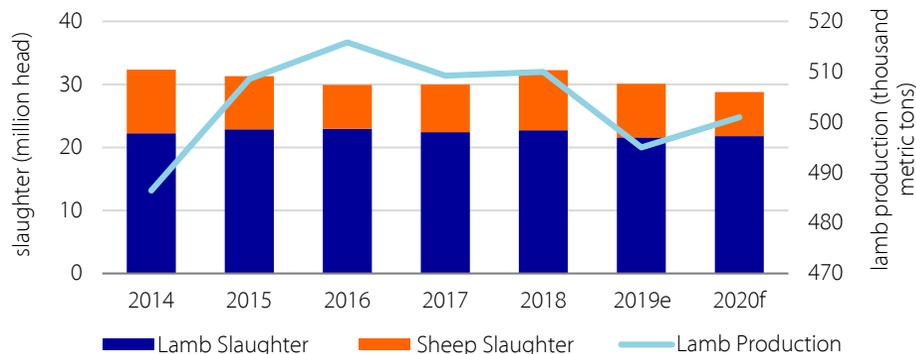
High sheep slaughter in 2018 reduced lamb availability through 2019, with slaughter numbers down 7%, as of August. With continuing dry conditions through many sheep-producing areas in 2019 limiting the ability for widespread restocking, Rabobank expects that lamb slaughter will be about the same in 2020.

Strong export markets – principally the US – will support lamb prices, but any upward price movements as a result of low numbers are likely to test margins.

Cattle slaughter and production are forecast to fall in 2020



Lamb slaughter steady in 2020 – better conditions could lift production



New Zealand's Beef and Sheepmeat Outlook Is Positive

Strong demand from China is set to continue, underpinning historically high pricing levels along red meat supply chains in 2020.



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- We see a marginal increase in beef and sheepmeat production
- Adapting to freshwater and climate change reforms will challenge the sector
- The Brexit process poses a downside risk to UK/EU market access

Beef production will lift, in line with herd growth

Beef production is expected to increase marginally in 2020, to 643,000mt, up 2%. This follows a small lift (+2.6%) in national beef cattle herd numbers over the last 12 months, increasing the number of steers and heifers that will be available for slaughter during 2020.

A significant jump in demand from China, which has overtaken the US as New Zealand's largest export market, will continue to put upward pressure on export returns and underpin farmgate pricing at levels equal to, or above, those received in 2019.

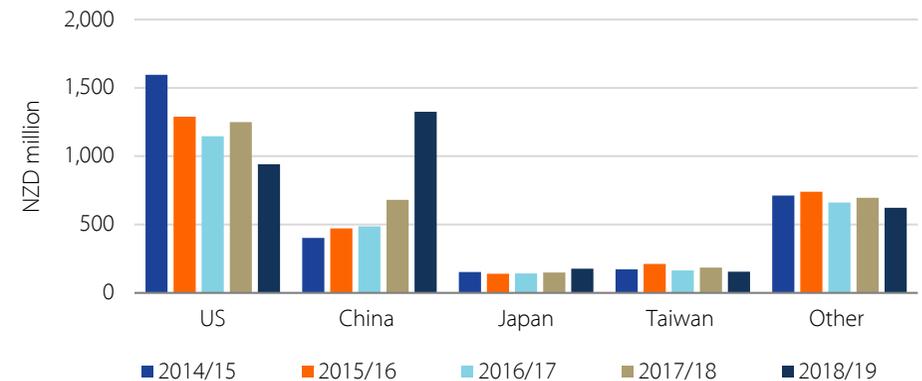
Limited availability of New Zealand supplies, combined with an expected easing of the New Zealand dollar, will underpin returns from the US market.

Market conditions for sheepmeat remain in New Zealand's favor

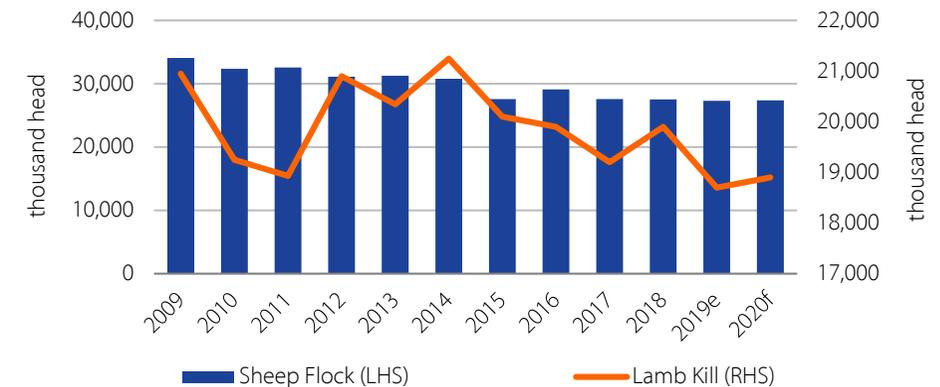
Restricted global supplies and strong demand from key export markets will likely support farmgate prices at record levels. With in-market pricing expected to remain firm in most markets, any favorable exchange movements could see export returns potentially move higher in 2020.

New Zealand's lamb slaughter for 2020 is expected to increase slightly (18.9m head, up 1%), following a historically low lamb slaughter in 2019. New Zealand's sheep flock numbers stabilized during 2019, to sit at 27.4m head (+0.4%).

China overtakes the US as New Zealand's largest beef export market



Stabilizing flock to support small lift in lamb production





Salmon Supply Is Expected to Grow Modestly in 2020

Norway is expected to be the main, albeit modest, supply driver in 2020.

- We expect lower growth rates in global salmon supply
- Salmon prices have softened, but are expected to firm in 2020
- More capital is diverted toward novel salmon-farming technologies

Lower growth rates lie ahead for 2020

Global salmon supply increased slightly more than expected in 2019, resulting in an estimated overall annual growth of 6.2%. For 2020, we expect growth to slow down to 1.9%, with limited growth in Norway and especially Chile.

Prices likely to recover from an unexpected dip in the summer

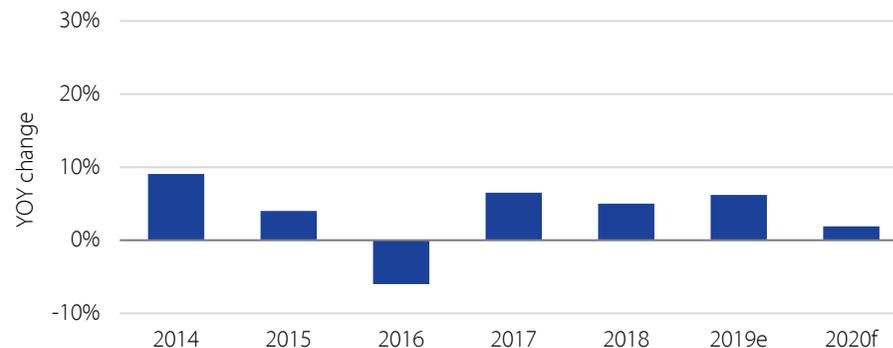
After record-high levels in 2018, salmon prices have been under pressure since Q3 2019. This price decrease was a result of high harvest levels in Norway, in a period of cyclical low demand. We expect this soft price trend to pass, and our forecast is for salmon prices to range between NOK 50/kg and NOK 65/kg in 2020, with expected tighter supply pushing up prices.

Novel ways of salmon farming are emerging

Given the large market size and high profitability of salmon, and the supply constraints of sea-based farming, alternative farming techniques – such as land-based aquaculture using recirculating aquaculture systems (RAS) and off-shore farming – are attracting more investment. Although the number of proposed projects is increasing day by day, particularly for RAS salmon, we don't expect to see significant volumes contributing to salmon supply from these alternative techniques in 2020.

Large salmon-farming companies are also increasingly using applications of post-smolt systems. We already see gradual improvements in biology due to application of post-smolt systems.

After three years of reasonable growth, we expect salmon supply expansion to slow down in 2020, but a lot depends on biology



Prices have softened in Q3 2019, but are expected to increase in 2020



Shrimp Industry Is Growing, Despite Low Prices

Growth is driven by Ecuador, followed by Vietnam and Indonesia.



- Despite low prices, supply growth continued in 2019
- We expect supply to continue growing in 2020, similar to 2019
- We expect low prices to persist in 2020

Supply growth potential remains, despite the price correction

We expect 2019 shrimp production to be slightly higher than 2018 volumes. This is primarily driven by Ecuador, but Vietnam and Indonesia are also recording growth in 2019. The drivers are different in each region, but intensification is the main theme. Ecuador is gradually increasing the density of its farming operations – and due to this, a record growth rate of 20% to 25% is expected in 2019.

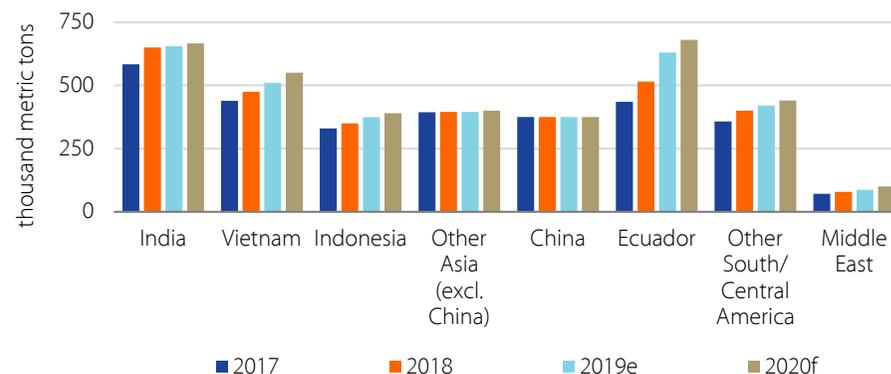
India, the largest producer, was the main exporter to contract in supply in 1H 2019 – a result of low prices, combined with white feces disease and weather issues. However, a recovery in 2H 2019 is expected, with the year ending with the possibility of marginal growth.

We expect this to set the scene for further supply expansion in 2020. However, if prices do not recover from 2H 2019 levels, at least in Asia, growth may not eventuate. In 2020, we do expect Ecuador to continue its expansion, although not at the same pace as in 2019. This depends on many factors, including weather, as well as China, Ecuador's key export market.

Prices have remained low, with a temporary recovery in 2H 2019

The mild price recovery in 2H 2019 has been driven by clearing inventories in import markets, such as the US, and by reduced supply from India. The large growth of Ecuadorian supply was almost entirely directed to the Chinese market – and thus did not impact western markets. Nevertheless, 2019 price levels faced by all exporters are considered low. The least efficient farmers are likely to be losing money at 2H 2019 price levels, allowing the best performers to gain market share in this expanding industry.

Shrimp expansion continues in 2020



Low-price period started in 2018 and continued in 2019



Fishmeal Market Sees Both Lower Supply and Lower Demand

African swine fever has impacted the demand for fishmeal in piglet feed in China, countering the effect of lower supply in 2019. We expect a similar pattern for 2020.



- Fishmeal supply has been relatively stable
- Fishmeal prices have been volatile, but recently softened due to ASF in China
- Alternative aquafeed ingredients are gaining popularity

Stable fishmeal supply is expected for 2020

Global fishmeal supply in 2018 was as good as it gets. Due to lower anchovy quotas and a mini-ban in Peru's first fishing season, fishmeal production is estimated to decline somewhat in 2019. For the second fishing season in 2019, a similar quota (about 2mmt) is expected, which would keep the fishmeal supply situation stable in 2020.

Fishmeal prices lack support, due to ASF in China

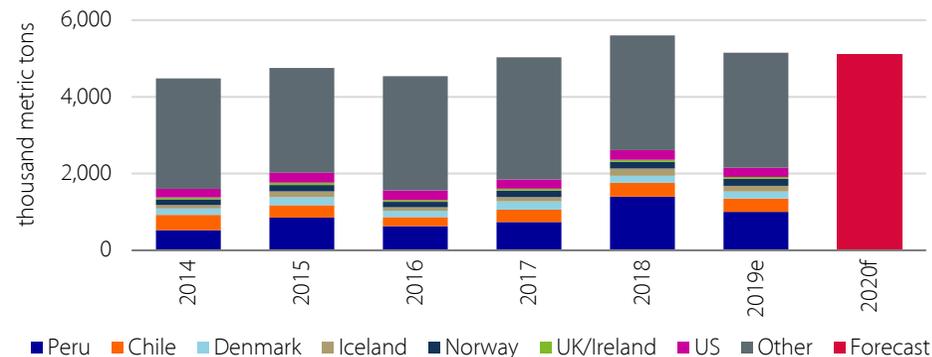
China is the largest consumer of fishmeal – and currently fishmeal stocks in China are at high levels, due to the impacts of ASF, which has reduced demand for fishmeal used as piglet feed. This has resulted in stable to weaker fishmeal prices in 2019, despite lower supply.

In the absence of a supply issue in Peru, 2020 prices are likely to remain soft, due to the ongoing weakness in China's piglet feed demand caused by ASF. We expect fishmeal prices to fluctuate between USD 1,200/mt to USD 1,600/mt in 2020.

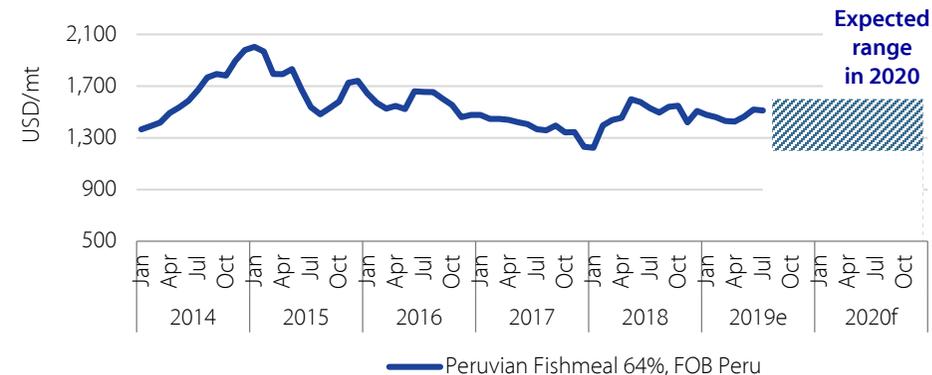
Alternative ingredients are becoming more popular in aquafeed

Alternatives to fishmeal and fish oil as ingredients for aquafeed continued to attract investor, retailer, consumer, and feed formulator interest in 2019. A number of salmon farmers and leading feed formulators have started using algal oils and insect meals in their aquafeed formulae in 2019 – and we expect this trend to continue in 2020 and beyond. Due to their current small production volumes, we don't expect alternatives to impact fishmeal and fish oil prices just yet.

Fishmeal supply declined in 2019, with expectations for stability in 2020



Despite the lower supply, fishmeal prices have been relatively stable



3 What's on the Grill?

The major issues we will be tracking in 2020 are:

African Swine Fever

A global priority issue that affects all proteins

Trade

Animal protein trade is rising, against a background of uncertainty

Sustainability

The pressure to act is building, shifting the focus to opportunities

Alternative Proteins

Growing strongly, but looking more additional than alternative



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African Swine Fever Is Rapidly Becoming a Global Priority

The disease is likely to spread across Asia, and potentially beyond, in 2020, due to frequent shipments of feed and live animals – as well as the movement of people and equipment – across borders.

ASF will dominate global animal protein in 2020, with the disease expected to keep spreading while recovery begins.

We expect ASF to spread to new countries in 2020, as we do not believe current measures will effectively contain the disease. However, we do not expect new countries to experience the same level of impact as China and Vietnam. Elsewhere, farms are on high alert and have improved biosecurity, the production structure is not as fragmented, and the herds are generally smaller.

Biosecurity will remain the key focus to prevent ASF from spreading further, but biosecurity measures have not, to date, proven to be effective in all areas.

Vaccine research is actively underway in China, and we expect some vaccines to be commercialized in China in 2020. It remains unclear if trialing of these live vaccines will be effective or could lead to the disease spreading further.

Overall, the herd loss caused by ASF in 2020 is expected to be lower than in 2019.

Strong prices to trigger rebuilding, yet disease risks will impact the recovery

The impact of ASF reaches beyond herd losses – it reduces confidence in new investment in pig-farming. Even though hog prices are strong, ongoing disease risks mean production expansion will be undertaken cautiously.

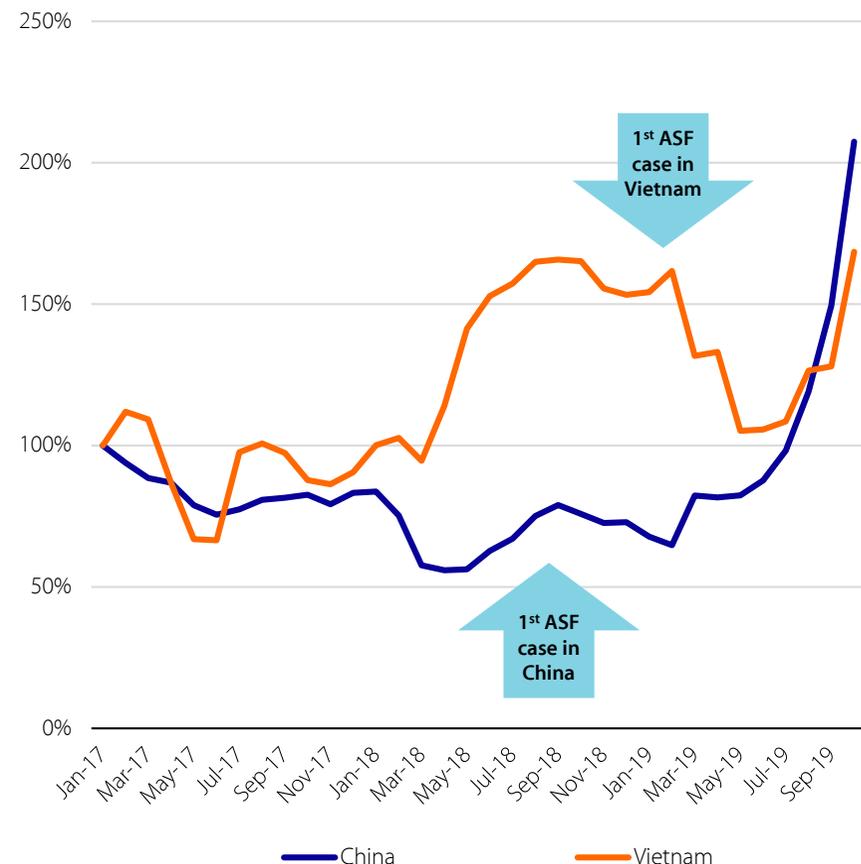
Nevertheless, we expect consolidation of pig-farming in ASF-affected countries in 2020. And at the same time, we see increased production in exporting countries.

Price elasticity will be tested further in 2020

We expect high pork prices to continue into 2020, with prices challenging the strength of demand. We see prices for consumers rising, along with other proteins substituting pork in markets directly influenced by pork trade.

High prices may benefit producers, but processors and downstream players in food retail and foodservice will remain under pressure due to high sourcing costs. They will need to adjust menus and ingredient mixes to manage this cost pressure.

Live hog prices in China and Vietnam highlight the complex responses to ASF and the inevitability of rising prices



Rising Animal Protein Trade Bucks the Global Trend

ASF has already generated additional animal protein trade in 2019, and we expect further growth in 2020 – albeit subject to many uncertainties.



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Growing global animal protein trade faces many uncertainties in 2020

China has increased imports across all species in 2019, with pork imports up by 44% (Jan-Sep YOY), beef by 54% (Jan-Sep YOY), poultry by 51% (Jan-Sep YOY), and seafood up 29% by value and 27% by volume (Jan-Sep YOY), in response to reduced pork production.

Given the ongoing spread of ASF, we expect China to increase animal protein imports further in 2020. We also expect other countries in Asia to increase imports as the impacts of ASF become more widespread.

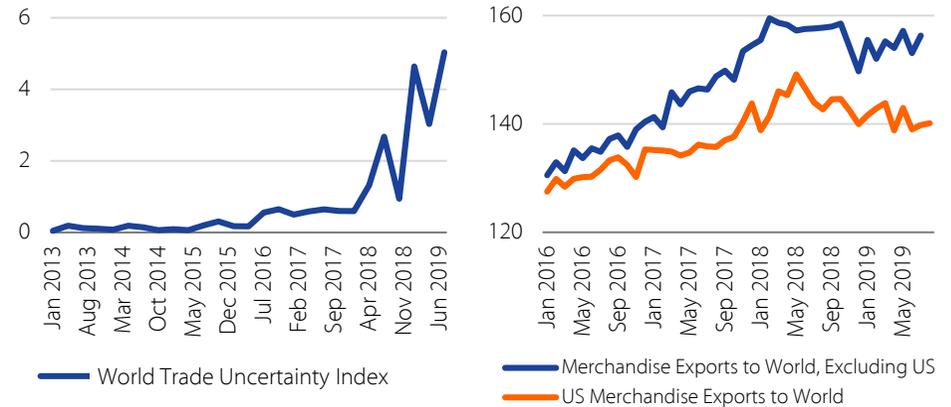
Increasing animal protein trade goes against the trend of a decline in overall global trade, in response to rising trade uncertainties.

In global animal protein trade, we see five main issues creating uncertainty in 2020:

- ASF.** The specific impact on production, and local responses to ASF, will create considerable uncertainty around global animal protein trade in 2020.
- The US-China trade war.** While we do not expect a permanent resolution in 2020, ongoing or temporary increases in F&A trade are quite possible. Overall, we see this issue adding to uncertainty in trade.
- Brazil's access to key chicken export markets.** Brazil has had problems with exports to Saudi Arabia and the EU, which has created uncertainty in trade.
- Brexit.** As the UK has been the EU's largest importer for all proteins, potential changes to UK access for current exporters will continue to create uncertainty in trade.
- USMCA.** We believe the United States-Mexico-Canada Agreement will be ratified, but ongoing delays in this process add to uncertainty.

Some of these uncertainties will simply result in changes in currency crosses, while others will result in more trade 'friction' and higher transaction costs; some may result in trade bans or blockages.

Rising trade uncertainty and declining exports highlight challenges for trade

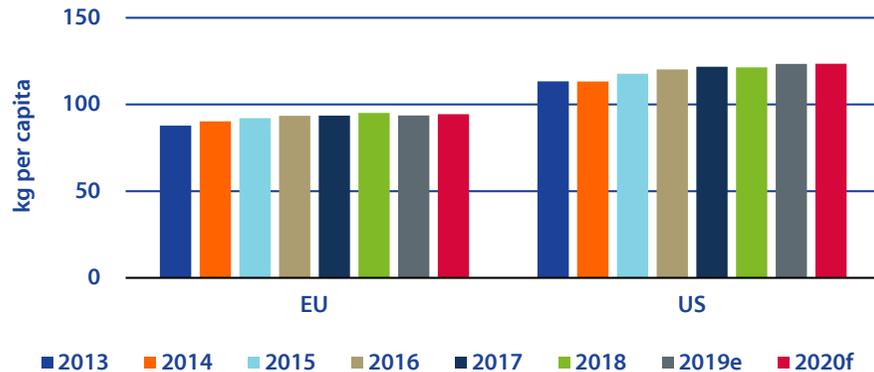


	Nov 1, 2019	3M	6M	12M
EUR/USD	1.12	1.07	1.08	1.12
EUR/GBP	0.86	0.84	0.84	0.83
USD/CAD	1.32	1.34	1.34	1.36
USD/BRL	3.98	3.90	4.10	4.10
USD/MXN	19.10	19.60	19.80	20.00
USD/THB	30.17	32.50	32.80	33.70
AUD/USD	0.69	0.67	0.66	0.65
NZD/USD	0.64	0.62	0.62	0.60
USD/IDR	14039	14250	14300	14950
USD/CNY	7.04	7.25	7.45	7.75

Are 'Alternative' Proteins Really...

As food, alternative proteins currently appear to represent additional or incremental growth in consumption.

Meat and seafood consumption in the EU and the US is not declining



In the western world, meat alternatives are not yet stealing growth from animal protein – they are adding to total protein consumption volumes

'More' has been the key word for alternatives in 2019. More media attention, more consumer interest, and more investment. Also: more products, and more competition in retail cases and at foodservice counters.

For consumers, it appears 'more' means more total protein. Contrary to expectations, the growing interest in alternative proteins has added to total protein consumption – the substitution effect is not yet clear in the consumption data. At the same time, animal protein consumption has been stable, or up slightly, in the EU and US in recent years. This is despite double-digit growth in alternatives' sales: 16% YOY growth in 2018 in the US and a 16% CAGR in the Netherlands since 2016.

In 2020, we expect alternatives to keep growing, along with meat and seafood consumption. We also expect more clarity as to whether alternatives are an addition to or a substitute for meat and seafood. Alternatives will need to improve their nutritional profile and eating quality, and address regulatory barriers such as terminology, in order to maintain current growth rates.

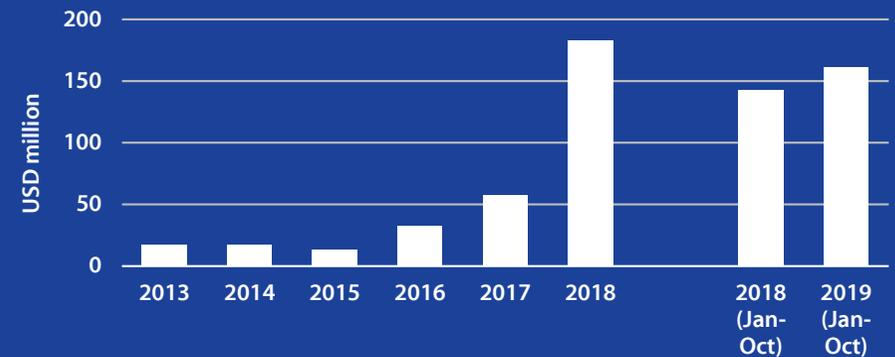
Source: OECD-FAO, Anterra Capital, Crunchbase, Rabobank 2019

an Alternative to Animal Protein?

In feed applications, alternatives are substitutes for animal protein feed ingredients.



Insect companies have raised large amounts of capital in the last two years



New investment is driving feed alternatives out of a niche as viable substitutes

Alternative proteins as feed ingredients have seen a significant ramp-up in investment, with over USD 200m invested in insect companies in the space of the 12 months to October 2019. We attribute this momentum to added functionality, engagement of leading feed formulators, and commitments from salmon farmers – much of which reflects rising consumer and retailer interest. Aquaculture has been the focus areas for the use of alternative proteins in animal feed.

Most investment is flowing into insect and algae production, although total availability remains low, compared with fishmeal and fish oil. This will start to change in 2020, as the new investments in alternatives' production start coming online. Bacterials and GM canola are also coming into production. Bacterials are also being considered for use with terrestrial animal protein farming, with commercialization expected in 2020.



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Sustainability: The Runway to 2030 Just Got Shorter

Spotlight on the resource footprint of animal protein supply chains looks set to intensify in 2020 and beyond. Technology will play an increasingly important role in providing sustainable animal protein.

The world's major sustainability goals have to be achieved this decade!

The year 2030 is a benchmark year for achieving a number of global sustainability targets, including reductions in greenhouse gas emissions under the Paris Agreement, and the 17 Sustainable Development Goals. We expect this to increasingly influence animal protein supply chains, through the actions of both markets and policy-makers, as they progressively take steps toward achieving these goals.

Promoting nutrient density supports animal protein sustainability

Animal protein is nutrient-dense food, delivering more nutrients (such as essential amino acids, omega-3, and iron) per mouthful than plant-based foods. And with high nutrient density comes a higher resource footprint. As the spotlight shines more brightly on this footprint, global animal protein will need to ensure that consumers and regulators understand the full value of animal protein's nutrient density in a sustainable food system.

Ultimately the market will define sustainable production

Defining what constitutes sustainable animal protein production is complex, as the impacts of production on the environment and animals varies between species, locations, and farming systems. This lack of clarity has hampered efforts by some stakeholders to develop long-term sustainability strategies. We believe the signals from the market – consumers, food retail, and foodservice – will dictate which issues are most important.

With increased focus comes innovation to reduce the resource footprint

Animal protein production systems are constantly evolving, and they have an impressive track record of innovating to improve productivity. Global animal protein supply chains are now starting to focus on innovations that help reduce their resource footprint. In Rabobank's view, there is significant upside potential for the deployment of new innovations to improve sustainability over the coming years.

Innovations to reduce animal protein's resource footprint:



Rabobank's Global Coverage of Animal Protein



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