

State of the Industry Report 2021

Pork

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Authors Matt Dalgleish

matthew.dalgleish@thomaseldermarkets.com.au

Andrew Whitelaw

and rew.whitelaw@thomaseldermarkets.com.au

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Global supply and demand trends

Supply – Herd

The United Nations Food and Agriculture Organisation (FAO) estimated the peak in the global pig herd at 992 million head in 2015. In 2018 the outbreak of African Swine Fever (ASF) in China saw the Chinese herd decline by an estimated 30% from pre-ASF levels, falling from 441 million head in 2017 to 310 million head in 2019. The impact of ASF in China has seen the global pig herd decline to the lowest level seen since 1997 with the FAO reporting a global herd of 850 million head in 2019.

The pig heard in the European Union (EU) has remained reasonably static for the 2015 to 2019 period at approximately 143 million head. The United States of America (USA) has seen a 14% growth in the size of their pig herd during the 2015 to 2019 period, reaching 78.6 million head in 2019 according to FAO estimates. The Brazilian herd has grown by 2% over the same time frame, with an estimated 40.5 million head as at the end of 2019.



Figure 1. Pig Herd - World, China, EU, USA and Brazil

The redistribution of the global pig herd since the outbreak of ASF in China has seen the Chinese proportion of the global herd fall from 45.2% in 2017 to 36.5% in 2019. The EU share of the global herd has increased from 14.8% to 16.8% over the same time horizon. Meanwhile, the USA has seen their proportion of the global pig herd lift from 7.5% in 2017 to 9.3% in 2019.



Supply – Production

The global production of pork mirrors the fall seen in the global pig herd. The Organisation for Economic Co-operation and Development (OECD) pork production data demonstrates an 11% decline in global pork production from 119,446 thousand tonne in 2017 to 106,279 thousand tonne in 2020. Weighing heavily on global pork production has been a 25% decline in Chinese production from 2017 to 2020, according to OECD estimates. Notably, annual Chinese pork production is not expected to lift beyond pre-ASF levels until 2025, based on OECD forecasts.



Figure 3. Pork Production - World, China, EU, USA and Brazil

Demand – Consumption

Chinese domestic pork consumption levels have fallen 25% from 2017 to 2020 as availability of product has been restricted due to the reduction in their domestic pig herd. Despite increased volumes of pork imports during this period China has been unable to completely fill the void created by ASF with imported pork product.



Figure 4. Global Pork Consumption by Country

The removal of Chinese and EU consumption allows more clarity on the domestic consumption patterns of the remaining nations. Vietnam and the Philippines also demonstrate a decline in domestic consumption as both nations have also experienced a reduction in their availability of pork product due to ASF induced reductions to their pig herd.

The Russian Federation and the USA have seen a 5% increase in their domestic pork consumption levels during the 2017 to 2020 period, according to the United States Department of Agriculture (USDA) statistics.





Figure 5. Global Pork Consumption by Country (Ex China and EU)

USDA pork consumption trends for the 2017 to 2021 period demonstrate that Chinese consumption has averaged 46.4% of total global consumption over the five-year period. The decline in Chinese consumption from 2017 to 2020 saw the Chinese proportion of global pork consumption ease from 50.1% in 2017 to 43.2% in 2020. USDA forecast the Chinese proportion of global pork consumption to increase to 44.9% in 2021.

Global Pig Demand - Consumption Share (5 year average)



Figure 6. Global Pork Consumption - Percentage Share

Per capita pork consumption patterns show that Chinese demand began to ease in 2015, falling 30% from 32.7 kg per person per annum to 22.7 kg per person per annum in 2020. The OECD anticipate per capita consumption of pork in China to increase to 31.0 kg per person per annum toward the end of the decade as the Chinese domestic herd rebuilds and more pork product becomes available. Growth in per capita pork demand in developed economies is expected to remain relatively stable over the next decade, according to the OECD estimates. However, increased per capita pork consumption is expected over the coming decade in the BRICS economies of Brazil, Russia and South Africa of 5.2%, 5.9% and 11.8%, respectively. A similar trajectory for per capita pork consumption growth is anticipated for several developing economies with the OECD anticipating an average growth of 11.6% in per capita annual pork consumption over the next ten years.



Meat consumption market share across major meat types demonstrates that the consumption of chicken dominates consumer choice in Australia, North America, South-East Asia and Japan (albeit marginally to pork in Japan). Meanwhile South Korean, Chinese and European consumers favour pork.



Figure 8. Beef, Sheepmeat, Pork and Chicken Consumption by Country/Region

Key import and export nations

USDA pork meat trade statistics for the last five years demonstrates that the EU, USA and Canada are the top three suppliers of pork product to the world, based on a volume basis. China, Japan and Mexico exercise majority control over the import side of the global trade equation.

A focus on fresh, chilled and frozen pork meat trade flows, on a trade value basis, highlights that within the EU the export of pork meat is dominated by Germany, Spain, Denmark and the Netherlands. Australia sits in 19th position in the global pork meat trade with average pork export values consisting of 0.3% of the total global trade over the last five years.

Figure 10. Global Pork Import Market Share by Country/Region

Figure 11. Fresh, Chilled and Frozen Pork Export Market Share by Country

In terms of the value of pork import flows of fresh, chilled and frozen pork meat Japan and China feature prominently over the last five years. While China has averaged 9.8% of the global trade over the last five years, the 2018 to 2019 period saw their import value increase from 7.3% to 17.9% as the impact of ASF took hold on the availability of domestically produced Chinese pork product.

Australia sits in 17th position in terms of market share of the value of global pork imports with the fiveyear average market share of imports sitting at 1.7% of the global trade of fresh, chilled and frozen pork product.

Figure 12. Fresh, Chilled and Frozen Pork Export Market Share by Country

Meat imports of all kinds had been growing in China before the outbreak of ASF, as the combination of increased population and per capita wealth growth fuelled the demand for meat proteins of all types. However, the outbreak of ASF in 2018 saw Chinese demand for imported pork product increase significantly. Over the last decade the value of imports into China has lifted by 3,910%.

Source: UN Comtrade, TEM

Figure 13. Change in Value of Pork Imports by Country, 2009 to 2019

Mexico and South Korea have also experienced robust growth in the value of their pork imports of 135% and 139%, respectively. Meanwhile Australia, the USA and Japan have demonstrated more moderate growth over the decade of 54%, 45% and 33%.

Source: UN Comtrade, TEM

Figure 14. Change in Value of Pork Imports by Country (Ex China), 2009 to 2019

A disaggregation of the trade flow of fresh, chilled and frozen pork product demonstrates that nearly 75% of the global trade consists of pork cuts; either frozen, fresh or chilled. Swine carcasses or half carcasses make up less than 9% of the global trade. Meanwhile hams, shoulders and cuts with the bone in constitute around 17% of the global trade.

Global Exports - Disaggregation Share (5 year average) 1.0% 3.9% Swine cuts, frozen Swine cuts, fresh or chilled 13.1% 42.1% Swine hams, shoulders & cuts (bone in), fresh or chilled Swine carcasses and half carcasses, fresh or chilled Swine hams, shoulders & cuts 32.3% (bone in), frozen Swine carcasses and half carcasses, frozen

Source: UN Comtrade, TEM

Figure 15. Fresh, Chilled and Frozen Pork Export Share by Product Type

A graphic representation of the net trade flows of pig meat over the last decade signal China moving from a moderate net exporter of pork to a significant global importer.

An assessment of global market access for pig meat, based on a comparison of the simple average of pork product tariff regimes across the world demonstrates relatively easy access to the Americas, Australasia, the European Union and China. The global tariff sits at an average of 21.7% making it the 94th lowest tariff out of 1,259 product classifications, based on the HS4 product classification methodology. Turkey holds the highest tariff for pork meat at a simple average of 223% across pork products.

Figure 16. Net Trade Flows of Fresh, Chilled and Frozen Pork Meat 2009

\$1M

Figure 17. Net Trade Flows of Fresh, Chilled and Frozen Pork Meat 2019

Figure 18. Average Tariff Regime for Pork Meats

-\$100M -\$1M -\$10k -\$100

-\$100M -\$1M -\$10k -\$100 \$1

African Swine Fever

Since 2016 the presence of African Swine Fever (ASF) has increased across several countries within Africa, Europe and Asia. While Europe has accounted for 67% of reported ASF outbreaks, most of the reported animals lost to the virus has been centred within the Asian region, which has consisted of 82% of reported global losses.

ASF has made its way to Australia's doorstep with the virus reported in Timor Leste in September 2019 and Papua New Guinea in March 2020.

Figure 20. Global Spread of African Swine Fever

ASF was first reported in China in August 2018. During 2019 the Chinese government publicly acknowledged significant impact to their domestic pig herd. In 2020 it was estimated that the decline in pork production within China created a 25 million tonne gap in available pork meat, which has been partially offset by an increase to imports of pork product. During 2020 the proportion of pork imports as a percentage of domestic Chinese pork production reached a peak of 14.5%. Prior to the outbreak of ASF in China the previous peak in pork imports as a percentage of production was 3.7% in 2016.

The domestic situation

Supply

Herd size and distribution

During the mid 1970s the Australian pig herd entered a growth phase moving from 2.2 million head to 2.9 million head in the early 2000s. Industry rationalisation and a period of high feed costs saw the herd shrink to record lows by 2012 of just under 2.1 million head. In recent years, the herd has stabilised around 2.4 million head. The Australian sow herd spent much of the 1970s through to the early 2000s ranging between 300,000 to 350,000 head. The decline in the overall pig herd in 2012 to record low levels was preceded by a drop in the sow herd toward 250,000 head. In recent years the sow herd has stabilised at around 265,000 head.

Australian Pig and Sow Herd

Figure 22. Australian Pig and Sow Herd

Australian Bureau of Statistics data demonstrate a relatively even distribution of pigs across the mainland. Queensland holds the nation's largest pig herd at just over 607,000 head or nearly 27% of the total Australian herd. Victoria sits in second position with nearly 543,000 head and representing 24% of the national pig herd. Meanwhile, Tasmania holds the smallest herd at just under 10,000 head or 0.4% of the national herd, of which 98% are distributed in the northern regions of the island.

Figure 23. Distribution of the Australian Pig Herd by State

The distribution of the pig herd within Queensland is centred within three regions: Condamine, Burnett Mary and Queensland's Murray Darling Basin. These three regions account for nearly 95% of the total pig herd within the state.

Figure 24. Distribution of the Queensland Pig Herd by Region

The Victorian pig herd is dominated by the North Central region with more than half of the pig population residing in this region. The top three regions for pig numbers in Victoria are North Central, Goulburn Broken and Corangamite which hold nearly 82% of the state's pigs. There are nearly 323,000 pigs located within South Australia, this represents about 14% of the national pig herd. Within South Australia the top three regions of Murray Daring Basin, Northern & Yorke and the South-East contain nearly 90% of the pig population for the state.

Source: ABS, TEM

Figure 25. Distribution of the Victorian Pig Herd by Region

New South Wales holds around 435,000 pigs, or just over 19% of the national herd. The distribution of pigs across NSW is dominated by the regions of Murray and Riverina. Combined, these two areas contain approximately 91% of the pig tally in NSW.

Source: ABS, TEM

Figure 26. Distribution of the New South Wales Pig Herd by Region

Figure 27. Distribution of the South Australian Pig Herd by Region

The West Australian pig herd is estimated at nearly 340,000 head or around 15% of the national total. The distribution of pigs within the state is limited to three regions: Rangelands, Northern Agriculture and the Peel-Harvey area. The Rangelands region dominates the states pig herd distribution, accounting for nearly 60% of the state's herd.

Figure 28. Distribution of the Western Australian Pig Herd by Region

Slaughter Trends

Annual Australian pig slaughter and production trends show a reasonably consistent growth pattern over the last five decades. The decline in the pig herd experienced during the first decade of the 2000s had a noticeable impact upon slaughter and production levels. The peak in slaughter occurred in 2003 at 5.7 million head, easing by 21% to the 2009 lull of 4.5 million head. Since 2009 annual slaughter levels have lifted by nearly 19% to reach 5.3 million head in 2020.

The 2003 peak in annual production levels at nearly 419 thousand tonnes staged a 23% decline to the 2009 low of 324 thousand tonnes, mirroring the fall in slaughter volumes during that period. Since 2009 annual pork production has staged a full recovery, reaching a new peak of 424 tonnes in 2018 and achieving production levels of nearly 419 tonnes in 2020. Despite slaughter volumes not yet reaching a new peak production was able to progress beyond the 2003 peak in recent years on the back of increased carcass weights.

Figure 29. Australian Pig Slaughter and Pork Production

The monthly seasonal trend in pig slaughter volumes demonstrates a normal variation between 390,000 to 490,000 head per month across the year, as identified by the 70% range which outlines where monthly slaughter has fluctuated between for 70% of the time over the last two decades.

During a normal season there is a build-up in slaughter volumes from the start of the year, with a dip in slaughter occurring during the Easter recess and leading to a late autumn/early winter peak. Monthly slaughter volumes tend to decline gradually through winter to mid spring, before increasing pre-Christmas.

Figure 30. Australian Pig Slaughter Seasonality - Monthly Volumes

Production and carcass trends

Long term production trends across meat types within Australia demonstrate robust and steady growth in the level of chicken production. Pork production, the lowest of the four meat production types, demonstrates more moderate and stable growth levels compared to the sheep meat and beef production sectors. A higher reliance on climate and pasture availability within the red meat production enterprises necessitates a more variable approach to production levels.

The distribution of pork production within Australia shows slightly different picture to the distribution of the pig herd. Although the mainland states still dominate pig production, with Queensland leading the share of production, the growth in slaughter capacity in South Australia since the early 2000s has seen this state overtake both Victoria and NSW in terms of their share of pig production in recent years.

Current ABS pig production data highlights that Queensland holds nearly 25% of the market share of national pork production and considering that Queensland holds 27% of the national pig herd it is hardly surprising to see this state dominate the national pork production volumes.

Despite South Australia holding just 14% of the national pig herd the state manages to process nearly 23% of Australian pig production, suggesting that there are good volumes of southern NSW pigs and western Victorian pigs that cross the border to be processed.

Analysis of the annual growth/decline in pork production levels demonstrate growth levels between 2%-7% is relatively common over the last five decades. Periods of production decline tend to be less frequent and tend to occur at times of high feed grain prices. Despite the reduced frequency of productions decline, when a reduction occurs, they more frequently exceed the 5% level, with five of the last nine years when a decline occurred extending beyond the 5% level. Since 1975 annual growth rates have averaged 3.5%, while declines have averaged 4.5%.

Figure 31. Australian Beef, Sheepmeat, Pork and Chicken meat Production

Figure 32. Distribution of Australian Pork Production by State

Figure 33. Share of Australian Pork Production by State

Figure 35. Australian Pig Carcass Weight - Annual Average

National carcass weight trends have shown steady growth over the last five decades, although there was a period of stagnant carcass weight gain through the 2000s. Since the early 1970s the national pig carcass has gained nearly 30kg, reaching a peak of 78.3 kg in 2020. Across the last five decades pig carcasses have increased weight by an average of 587 grams per year with pig carcasses in 2020 approximately 60% heavier than carcasses produced in the early 1970s.

Throughout the season the average national pig carcass weights can vary between 72kg to 80kg. The trend in carcass weight demonstrates a growth phase from the start of the season through to an early winter peak, followed by a steady decline in carcass weights to the seasonal low in weights during the December period.

Figure 36. Australian Pig Carcass Weight Seasonality - Monthly Average

Demand

Domestic retail

consumption trends

Domestic consumption patterns for available pork within Australia, combining both domestically produced pork and imported product highlights a growth in the consumption of imported pig product during the downturn in the national herd and the domestic production experienced at the start of the 2000s. In 1999 the share of imported pork consumed domestically was 8%. However, by 2010 this had grown to 47%. During the last decade the share of domestic consumption of imported pork has averaged 46% per annum.

Import Share Domestic Share Source: ABS, APL, ABARES, TEM

Figure 37. Share of Available Pork in Australia - Imported versus Domestic

Over the last few decades, the per capita domestic consumption of red meat in Australia has been in decline, with the consumption of chicken and pork gaining favour. Since 2000 beef consumption has dropped 41% from 37.5 kg per annum per person to just 22.0 kg in 2020. Sheep meat consumption has shown a similar decline, off 48% from 12.5 kg per person per year in 2000 to just 6.5 kg in 2020. Chicken consumption is up 50% from 31.1 kg in 2000 to 46.9kg in 2020. Meanwhile, pork consumption has gained 35% from 19.6 kg to 26.5 kg over the same period.

Figure 38. Australian Per Capita Domestic Meat Consumption by Meat Type

Despite the decline in market share of beef consumption on a per capita basis it remains the largest meat spend at the retail level on a value basis with 35% of the retail domestic spend on meat product going towards beef. Chicken, the high volume and low value transaction, holds the second spot in terms of proportion of the retail meat spend with a 30% share. Lamb and pork share the third position with 11% of the retail spend, with lamb tending towards the higher cost, lower volume transaction in recent years. Whereas the pork transaction has demonstrated a higher per capita volume than lamb, but at a lower retail price, per unit.

Figure 39. Fresh Meat Market Share - Retail

Food service sector

Consumption trends across the food service sector highlight a preference for pork consumption within the dining out segment of the food service industry which consists of 50% of total food service demand. The institutional segment (which includes hospitals, aged care facilities, defence, correctional facilities, corporate and the education sector) comprises of nearly 25% of the share of the food service spend on pork.

Source: MLA, RIRDC, FA, TEM

Figure 40. Pork and Smallgoods Market Share - Food Service

Figure 41. Fresh Meat Market Share - Food Service (Take Away)

Filtering the food service sector by service type and comparing across meat categories a focus on the takeaway segment of the food service industry demonstrates that seafood and poultry are the most popular meats, each with 38% of the takeaway consumption within Australia. Pork consumption at the takeaway level sits in third place on 10% of the share, behind beef on 13%.

The dining out segment shows a clear preference for poultry with a 45% share of the food service demand in dining out establishments. Pork, beef and seafood all share the second position with 17% a piece.

Figure 42. Fresh Meat Market Share - Food Service (Dining Out)

Figure 43. Fresh Meat Market Share - Food Service (Events)

The food service events category highlights poultry meat as a clear winner with 50% of the market share, followed by seafood on 30%. Meanwhile, pork and beef are neck and neck for third and fourth place with 10% and 9% share, respectively.

The institutional segment of the food service industry shows the most even spread of demand across meat types. Although poultry meat remains the clear favourite on 32% it is only marginally ahead of seafood on 24% of the market share. Beef and pork are separated by just two percentage points for third and fourth position on 21% and 19%, respectively.

Source: MLA, RIRDC, FA, TEM

Figure 44. Fresh Meat Market Share - Food Service (Institutional)

Exports and import competition

An assessment of the trade flows for pork product into and out of Australia over the last three decades shows that for much of the 1990s export and import volumes were relatively closely matched. The herd and production decline seen within Australia during the first decade of the 2000s coincided with a steady increase in imported pork volumes, while export volumes eased gradually over the decade. Recent years have seen a sharp decline in pork import volumes as the increased ASF related demand from China for international pork product appears to have diverted flows from Australia. Despite the dip in imported pork into Australia since 2018 the volume of imports still represents around six times the volume on exports.

Analysis of the trade flow of fresh, chilled and frozen pig meat out of Australia on a value basis over the last five years indicates that southeast Asian nations dominate the trade. Singapore has taken nearly 56% of the total value of Australian pork exports. Outside of the Asian sphere, Papua New Guinea and New Zealand feature prominently, holding approximately 13% and 8% of the Australian export value, respectively.

In terms of pork import flows into Australia, key supply nations are dominated by North America and the European Union. Approximately 46% of imported fresh, chilled or frozen pork into Australia comes from either the USA or Canada. Meanwhile, around 51% is supplied by the EU nations of Denmark, Netherlands or Ireland.

2.8%

32.5%

9.5%

5.6%

13.0%

Figure 46. Fresh, Chilled and Frozen Pork Exports from Australia -Market Share by Country

Figure 47. Fresh, Chilled and Frozen Pork Imports to Australia -Market Share by Country

36.7%

US

Denmark

Canada

Ireland

Others

Netherlands

Prices

Pigs

Domestic price trends

On a nominal basis annual average Australian pig prices have demonstrated an upwards trend over the last three decades from 200c/kg HSCW to over 350c/kg in recent years. However, on an inflation adjusted basis the price trend has moved broadly sideways, albeit with a slight downward bias, ranging between 300c/kg to 400c/kg, in current dollar values for much of the period.

It is not uncommon to see a downward trend in deflated prices over the longer term as often industry efficiency gains allow for products to be offered at cheaper prices and this trend often presents itself across agricultural commodities once the impact of inflation is removed.

Figure 48. Australian Pig Price - Nominal and Inflation Adjusted

Assessment of the long-term variation in the annual deflated pig price shows that pig prices have averaged 354c/kg HSCW over the last three decades, with a normal range between 316c/kg and 391c/kg as outlined by the 70% range boundary. The deflated price pattern demonstrates that prices would be considered extreme (beyond the 95% range) when below 279c/kg or above 428c/kg, based on dollar values from the 2021 season.

Figure 49. Australian Inflation Adjusted Pig Price

International price comparisons

An assessment of pig price comparisons between selected international participants to the pig meat trade demonstrates that Australia is a higher cost producer compared to large pig meat export nations like the USA and Denmark. The domestic price impact upon China of ASF since 2018 is with pig prices within China during the depths of their pork production crisis reaching levels that were nearly three times the price of the USA and Denmark.

Figure 50. International Pig Prices

Retail Prices

The last decade have seen retail red meat prices increase in line with higher livestock pricing at the saleyard. The growth in retail pricing for lamb and beef product is particularly evident from 2015 onwards. Retail beef prices have increased 65% from 2009 to 2021 and retail lamb prices has shown similar growth levels, rising 63% over the same period. In 2021 retail beef product averaged 1590c/kg meanwhile retail lamb has averaged 1684c/kg.

Retail pork pricing has demonstrated more moderate growth during the 2009 to 2021 period, increasing by 23% to average 1256c/kg in 2021. The price of chicken product at the retail level has been relatively static, falling just 2% over the last decade. In 2021 the price of retail chicken product averaged 870c/kg.

Figure 51. Beef, Lamb, Chicken and Pork Retail Prices - Australia

Feed

Feed prices remain an extremely factor in determining the profitability of the pork industry. Feed grain inputs are a significant cost to the pig industry, representing nearly 60% of the operating cost structure. Feed grain purchases are often locked in ahead of the pig rearing schedule by pig producers, via future delivered contracts or wheat financial hedging products. Analysis has shown that feed grain price movements often have a leading influence on pig price levels.

Peaks in feed prices are often followed by a peak in pig prices the following season. It is likely that elevated grain prices pressure pig producers to lighten their capacity as margins come under pressure. Due to the forward purchase of feed pig producers often delay their reduction in capacity in response to the rising feed costs.

However, once capacity is reduced, production levels fall and the resulting drop in supply encourages pig prices higher. Increased pig prices restore producer margins and, if feed prices decline the following season due to improved harvest conditions. This can encourage producers to expand pig herd numbers again and supply/production lifts, subsequently pressuring pig prices lower.

Figure 52. Australian Pig Price versus Feed Price

Feed pricing and trends

Wheat

The poor climatic conditions in the eastern states of Australia during the seasons 2018-2020 resulted in the below-average production of grain crops. Wheat is one of the largest inputs into the feed ration within the pork industry, and the lack of available supply caused prices to rise substantially.

The wheat market is influenced by local and domestic factors. Most price movements over the course of time are due to events overseas; this is due to our status as a major exporter of grains.

In recent years the drought conditions lead to our market being driven by a lack of domestic supply. This resulted in basis levels rising to post-deregulation highs. The basis is the premium (or discount) which Australia has compared to overseas futures values.

Figure 53. Australian Wheat Price Premium/Discount to US Wheat Futures

The 2020 crop was the second largest on record, and expectations were for an overall fall in pricing levels, which would have benefited pig producers with a lower cost of production.

However, the reality was that whilst the basis level fell from historical highs to discounts in many areas, events overseas offset the downward price pressure to cause the overall price to trend higher. The higher futures level has meant that, despite lower basis levels, the overall price to buy grain has increased for most pork producers.

Nevertheless, there have been opportunities for some pork producers with price risk management strategies in place to take advantage of the lower futures prices in the early part of last year to reduce their overall feed costs. Producers should ensure that they have adequate risk management policies to reduce their exposure to volatile commodity markets. Events overseas have overtaken our wheat (and other grain) market pricing. Indeed, the movement in price for wheat has largely been attributed to movements in corn.

There is a tendency in markets for commodities to trade in close relationships with others. This is due to their ability to act as substitutes for each other. As an example, when red meat increases in price, there is a tendency for consumption to move towards alternative meats like pork and poultry; the same occurs in grains and oilseeds.

We may not grow much corn in Australia, but that does not mean that price movements in corn will not impact the commodities we produce. There is a degree of interchangeability between corn and wheat, as they can be used for similar applications. The monthly change in the price of wheat and corn futures demonstrates that prices tend to track one another over time.

Since the beginning of 2020, China has become a substantial corn importer than in previous years. This has resulted in strong demand for corn on a global level, causing price increases in corn. Due to the strong price relationship between corn and wheat, the result is that wheat prices have followed the corn market up.

At the same time as increased imports into China, Brazil, the world's second-largest exporter of corn, suffered through a drought for their second corn crop of 2020/21, creating concerns for global supply.

Figure 54. International Wheat and Corn Prices

Barley

The barley market has been in turmoil throughout the past two years. This was a result of allegations of the dumping of barley into China by the Australian grain industry in 2016. These are allegations that have been refuted by the Australian government and all domestic representative bodies.

The investigation into alleged dumping by China was completed in May 2020 and it found that Australia had anti-competitively dumped barley in China. The result was a tariff of 73.6% as anti-dumping duty, and 6.9% as a countervailing duty for five years.

The combined 80.5% tariff is significant enough to ensure that barley exports to China from Australia would no longer be competitive. The barley price in May fell by between 15-20%, dependent on the port zone.

Figure 55. Australian Feed Barley Price

The investigation added an extra layer of risk to ownership of barley for export purposes, which resulted in discounting of barley. The spread between F1 and ASW grew, making the substitution of ASW with F1 a more attractive proposition for pig producers.

The average spread since the tariff introduction has been A\$71 in Kwinana, A\$64 in Geelong and A\$46 in Brisbane.

Due volatility to the of commodity prices and the sophistication increasing of pork enterprises, it will become increasingly beneficial to liaise with nutritionists to ensure that feed formulations take advantage of movements in spreads. This will allow producers to arbitrage and take advantage of the relative movement of value between feed inputs.

F1-ASW Price Spread 140 120 100 80 /mt 60 A\$/ 40 20 0 -20 -40 2017 2012 2013 2015 2016 2019 2020 2010 2014 2018 2011 2021 Geelong Brisbane Kwinana Source: TEM

Figure 56. Australian Feed Barley versus Wheat Price Spread

Soymeal

Most of the soy meal utilised in the Australian pork industry is imported from North and South America, with limited domestic production. The importation of soy meal has expanded during the past decade, from 589kmt during 2010, to 1.1mmt in 2020.

The price of soy meal in Australia is fundamentally driven by pricing in overseas locations. The soy meal price in Australia has consistently been higher than overseas values. On a monthly basis, the Australian national price has been on average at a premium of A\$138 premium over Chicago soy meal futures in A\$ terms.

The price of soy meal in Australia tends to follow the rises and falls of the overseas markets. The correlation between Chicago soy meal and Australia is 0.6, with 1 being a perfect correlation and 0 being no correlation. In contrast, the correlation with the Netherlands and Chicago Soy meal futures is 0.9. This makes it easier to manage price risk in other regions than it is in Australia.

At present, the lower correlation means that using soymeal futures for hedging of Australian price risk is problematic as often the variation in price between the offshore hedging tool and the local product is more volatile than the pricing movements of the underlying commodity itself. Therefore, the hedge introduces more price risk, rather than reducing it.

Figure 58. International and Australian Soymeal Prices

	CME Soymeal	NL Soymeal	Braz Soymeal	National Average
CME Soymeal	1.0			
NL Soymeal	0.9	1.0		
Braz Soymeal	0.8	0.8	1.0	
National Average	0.6	0.6	0.6	1.0

Figure 59. International and Australian Soymeal Price Correlations

Alternate high protein

animal feeds

There are alternative high protein animal feed inclusions available within Australia. Two commonly used inputs are tallow and meat & bone meal.

Meat and bone meal (MBM) are produced from abattoir waste products that are not suitable for human consumption. MBM is used extensively in animal feed. Tallow is rendered fat and is also used for feeding animals and making a wide range of soaps and lubricants.

Offal shares a relationship with other commodities. Tallow as oil is in the same basket as the oilseeds, and blood/bone meal is in the same basket as the oilseed meals such as canola and soymeal.

Meat and bone meal

Common replacements for meat and bone meal would be other protein meals such as canola or soybean meal. MBM maintains a strong relationship with CME soybean meal futures. The correlation between soymeal and MBM is 0.78, with 1 being a perfect correlation and 0 being no correlation.

The MBM market is less transparent than the soybean meal market. However, it is possible to use the CME soymeal futures market to gain an outlook on the direction of meat and bone meal prices within Australia.

Tallow

Tallow is an oil, and whilst a by-product of the animal slaughtering process, tends to trade in similar patterns to oilseeds.

The reason behind this close relationship between pricing trends is due to the fungible nature between tallow and oilseeds. Australian tallow has a strong relationship with Malaysian palm oil futures. The correlation is 0.88, with 1 being a perfect correlation and 0 being no correlation.

The close relationship between the price paid for tallow and the price of Malaysian palm oil futures allows for the possibility of hedging tallow price risk management through the Bursa Malaysia.

Figure 61. International Tallow versus Palm Oil Prices

Authors Matt Dalgleish matthew.dalgleish@thomaseldermarkets.com.au

Andrew Whitelaw

andrew.whitelaw@thomaseldermarkets.com.au

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