KPMG

International air freight connectivity

Pre-feasibility study

A preliminary assessment of perishable agricultural air freight export products in Regional NSW

November 2019

KPMG.com.au

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Executive summary

Overview

Australia's international competitiveness, is underpinned by a reliable and efficient transport sector. Increasingly, airfreight has become a key component of the freight task. Airfreight carries the nation's highest value product (measured in per tonne terms) and most time critical loads both across the country and via two way trade with the rest of the world.

According to a recent study by Infrastructure Partnerships Australia (2019) the export volume of airfreight, measured on a per capita basis, has increased approximately 60% over the last five years and more than half of the growth in airfreight exports over FY2017-18 can be attributed to demand for food products from China and other South-East Asian countries.

Most agricultural exporters are based in regional areas that are significant distances away from these export gateways which mainly locate in major capital cities. Fresh perishable products grown in regional NSW for export therefore are typically transported over long distances by road to an airport such as Sydney.

KPMG was engaged by Transport for New South Wales (TfNSW) to undertake a pre-feasibility study of international airfreight in NSW. The objective of the pre-feasibility study was to provide advice to the NSW Government on the potential viability of options to improve access to export markets for fresh food producers in NSW.

The findings of this report outline the opportunities for further investigation and can be found in Section 7.

In order to do this, the pre-feasibility study considered the following:

- Potential export markets for NSW perishable products
- Key high value perishable agricultural products suitable for air freight export
- Key requirements to develop a regional air freight supply chain in NSW
- Capacity and capability of regions in NSW to support an air freight supply chain

The outcome from the study is a list of key findings and next steps to undertake a detailed feasibility study.

Export markets

Five export markets (China, Japan, South Korea, Indonesia and United Arab Emirates) and two export hubs (Hong Kong and Singapore) were identified as prospective priority export markets for NSW air freight perishable products with high untapped market potential and a growing middle class with an appetite for fresh and clean NSW agricultural produce.

Perishable products

There are a number of different perishable products that can be exported from NSW, however the products with the highest value include beef, lamb, summerfruit, aquaculture, pork and dairy. Within these product categories there are significant opportunities for NSW to 'value add' through advanced food manufacturing and processing. Currently NSW exports around 12,000 tonnes of these products to the seven top markets. On current demand levels this is expected to almost double in 10 years. Other key products include citrus, berries, nuts, table grapes, melons, avocados and other vegetables (such as broccoli). These products present the greatest demand from consumers in the export markets identified in this study.

Supply chains

The export supply chain of perishable products needs to consider factors from farm gate to consumer, with each segment of the supply chain playing its role to reinforce efficient outcomes. Regional air freight supply chains involve both infrastructure as well as regulatory requirements. Infrastructure requirements include airside such as the airport, cargo handling and landside packaging, and temperature-controlled storage. Additionally, all perishable exports must comply with both Australian export and destination country import requirements.

Capacity of the regions in NSW

The pre-feasibility study also looked at production capacity and capability of NSW regions. Ten non-urban regions classified using the Australian Government's 'Natural Resource Management Regions' were assessed in terms of their potential in producing key export products.

As an initial assessment of perishable air freight in regional NSW, the study found that investment in improving regional air freight supply chains may be feasible, and further investigation into the supply chain will be needed to determine what infrastructure or policy options, including trade facilitation, would promote the best trade outcome to enhance growth of these markets.

Next steps

The pre-feasibility study provides an initial assessment of perishable air freight in regional NSW. The next step should focus on in-depth analysis of market demand and the supply chain, industry engagement and an economic, commercial and financial evaluation of the opportunity to ensure that the investment will be made to the area that would produce the best results for NSW farmers and producers.

Contents

Glossary and acronyms

Abbreviation	Definition
AACA	Accredited air cargo agent
AANZFTA	ASEAN-Australia-New Zealand Free Trade Area
ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
CASA	Civil aviation safety authority
CHAFTA	China Australia Free Trade Agreement
CITES	Convention on international trade in endangered species
CTO	Cargo terminal operator
DAWR	Department of Agriculture and Water Resources
EACE	Enhanced air cargo examination
FCL	Full Container Load: e.g. A full ULD delivered from a shipper, packer or freight forwarder to a CTO and not requiring further consolidation before loading
FOB	Free on board: The value of goods measured on a free on board (fob) basis includes all production and other costs incurred up until the goods are placed on board the international carrier for export
FTA	Free trade agreement
GDP	Gross domestic product
IATA	International air transport association
ICAO	International civil aviation organisation
ICS	Integrated cargo system
JAEPA	Japan-Australia Economic Partnership Agreement
KAFTA	Korea–Australia Free Trade Agreement
LCL	Less than full container load: e.g. palletised or loose cartons delivered for consolidation into ULDs before uplift onto aircraft
MICoR	Manual of importing country requirements
NRM	Natural resource management (region)
Pax	Passengers
RACA	Regulated air cargo agent
RPT	Regular public transport: Flight operations performed for remuneration and conducted to fixed schedules over specific routes, and on which seats and/or cargo space is available to the general public.
SAFTA	Singapore-Australia Free Trade Agreement
TfNSW	Transport for New South Wales
ULD	Unit Load Device: logistics equipment used to secure loose items into or upon so that freight can be secured as well as safely and efficiently moved through facilities and around aircraft holds e.g. AKE "can" or PMC air pallet
VHT	Vapour heat treatment

1. Introduction

Australia's international competitiveness, is underpinned by a reliable and efficient transport sector. Increasingly, air freight has become a key component of the freight task. Air freight carries the nation's highest value product (measured in per tonne terms) and most time critical loads both across the country and via two way trade with the rest of the world. These include high value and time sensitive goods such as fresh premium perishable produce, pharmaceutical and medical products, mobile phones, computer hardware and critical spare parts and materials. Australia's domestic and international air freight task represents 21% of our total international trade value, while being less than 0.1% by volume (Department of Infrastructure, Regional Development and Cities, 2018).

According to a recent study by Infrastructure Partnerships Australia (2019) the export volume of air freight, measured on a per capita basis, has increased approximately 60% over the last five years and more than half of the growth in air freight exports over FY2017-18 can be attributed to significant increases in demand for fresh food products from a rapidly expanding middle class in Northern and South-Eastern Asian countries. Yet, the importance of air freight to the economy is often overlooked, with government priorities and investment focused on passenger transport or land based freight such as road, rail and ports.

There are a limited number of export gateways for the air transportation of perishable and time sensitive products. The main gateways are the major capital city airports of Sydney, Melbourne and Brisbane which are some distance from the majority of export production.

For export producers in NSW, access to foreign export markets is constrained by access to these gateway ports. Most agricultural exporters are based in regional areas that are significant distances away from these export gateways. Fresh perishable products grown in regional NSW for export are typically transported over long distances by road to Sydney Airport, Melbourne Airport or Brisbane Airport. The long distances significantly increase the time taken for the fresh perishable products to reach their foreign export markets, which in turn impacts the quality (due to damage during road haulage) and financial returns to the exporter.

Currently, there is not a regional airport in regional NSW that has a dedicated freight aircraft service to international markets. As such, KPMG was engaged by Transport for New South Wales (TfNSW) to undertake a pre-feasibility study of regional air freight in NSW. A pre-feasibility study is a preliminary study undertaken to determine if it would be worthwhile to proceed to a detailed feasibility study or business case. The study has been defined to focus on perishable agricultural food exports.

The key aims of the pre-feasibility study were to consider the following:

- Where are the potential export markets for NSW perishable products?
- What are the key high value perishable agricultural products suitable for air freight export if effective infrastructure was available?
- What are the key requirements to develop a regional air freight supply chain in NSW?
- What supply chain issues should be considered for the high value export products?
- What is the capacity and capability of regions in NSW to support an air freight supply chain?

The outcome from the study is a list of key findings and next steps to undertake a detailed feasibility study.

2. Where are the potential export markets for fresh perishable NSW products?

A market assessment was undertaken to identify potential export markets for fresh perishable NSW products. A list of the top markets was developed consisting of countries that imported (via all freight transport modes) at least $750 million worth of NSW products over the last five years. The markets were assessed according to the size and access to each of the countries.

Market Size

Justification	Rating metric
1. Existing NSW export flows	
Whether NSW has significant existing trade links to the market.	Measured by value of total goods exports (via all freight transport modes) from NSW to the country, in the five years from the start of 2014 to the end of 2018 (ABS, 2019).
2. Untapped export potential	
Whether there is significant opportunity to grow trade with the market.	Measured by value of untapped potential for Australian exports to the country, given by the International Trade Centre's Export Potential Map. (International Trade Center, 2019)
3. Total addressable consumers	
Whether there are a significant number of consumers who may demand agricultural products from NSW.	Measured by population numbers (World Bank, 2019).
4. Market growth	
Whether the market's economic expansion indicates a scenario in which future demand for premium agricultural products from NSW is likely to increase.	Measured by economic growth in most recent annual data 2017 (World Bank, 2019).

Market Size

Justification	Rating metric
5. Consumer purchasing power	
Whether consumers are likely to be able to afford premium agricultural products from NSW.	Measured by GDP per Capita (World Bank, 2019).

Market Access

Justification	Rating metric
6. Location	
Whether the market is located in the regions in which there are NSW trade priority markets, and are also accessible by direct flights from NSW.	Measured by regional geography.
7. Market access for agricultural products	
Whether trade is open and relatively less restricted to the market.	Measured by bilateral agreements and shared regulations (DFAT, 2019).
8. Ease of distribution/ logistics	
Whether products are able to reach, enter and be processed in the market with speed and efficiency across customs, infrastructure, traceability and local distribution.	Measured by comparative ranking using the World Bank's Logistics Performance Index in 2018 (World Bank, 2019).

Overall Assessment

Justification	Rating metric
Overall opportunity assessment	
Whether the market represents both a strategic and operationally viable opportunity for NSW.	Measured by overview of performance on above criteria.

A summary of the market

Assessment is shown in the figure below

Country	NSW exports (2014-18)	Untapped export potential	Total addressable consumers (2017)	Market growth (2017)	Consumer purchasing power (2017)	Location
China	F	F	F	F	F	F
Japan	F	F	F	U	F	F
South Korea	F	F	F	M	F	F
Indonesia	F	F	F	F	U	F
UAE	M	F	F	U	F	F
Hong Kong SAR	F	F	U	M	F	F
Malaysia	F	F	M	F	F	F
New Zealand	F	U	U	M	F	F
India	F	F	F	F	U	F
Philippines	M	M	F	F	U	F
Singapore	F	F	U	M	F	F
Thailand	F	F	F	M	M	F
USA	F	F	F	U	F	F
Vietnam	F	F	F	F	U	F
Bangladesh	U	M	F	F	U	F
Canada	U	M	M	M	F	U
Italy	M	U	F	U	U	U
Netherlands	M	U	U	M	F	U
Switzerland	F	U	U	U	F	U
Taiwan	F	M	U	M	F	F
United Kingdom	F	F	F	U	F	U

F Favourable M Moderate U Unfavourable

Market access	Ease of distribution/ logistics	Overall opportunity
F	M	High
F	F	High
F	M	High
M	M	High
U	F	High
M	F	High
F	M	Moderate
F	F	Moderate
U	M	Moderate
F	U	Moderate
F	F	Moderate
F	M	Moderate
U	M	Moderate
F	M	Moderate
U	U	Low
F	F	Low
U	F	Low
U	F	Low
U	F	Low
U	M	Low
U	F	Low

Source: KPMG analysis

Each of these destinations exhibits a significant existing market size for NSW goods, as well as potential for growth into the future. Consumers in these international markets are likely to be able to afford premium fresh produce from NSW as a result of their average income levels, whilst the markets are accessible for trade and likely to host infrastructure relevant for cold chain and fresh produce.

Based on the market assessment results presented, the top five markets and two export hubs were selected for further analysis.

Top five markets

— China

— Japan

— South Korea

— Indonesia

— United Arab Emirates (UAE)

Export hubs

— Hong Kong SAR

— Singapore

While the five markets and two export hubs were identified as higher priority markets, this list is not exhaustive and other markets should not be discounted. Markets such as Malaysia, India, and Vietnam have not been not shortlisted but are emerging markets and may hold particular potential as longer term propositions. These other markets represent potential options for import and export trade because perishable food exports would not be traded into one market alone. Though consumers may not currently be able to afford premium imported agricultural products, and logistical capabilities restrict market access, many of these destinations are developing, and may be markets to continually reassess as investments are made into trading infrastructures and their business regulatory frameworks mature. Changing market access and protocols also need to be considered in the future for each market to align export priorities to current market access conditions.

The export hubs of Singapore and Hong Kong, which do not represent the largest demand within their market and thus are not included in the five priority markets, however, they have been included as hubs for accessing wider markets within their region. These locations operate sophisticated logistics, and are able to transfer product into a range of surrounding markets.

Key air freight export markets

01. CHINA

1.4b
Population

71
Total runways over 3km

3.3b
2018 value of export flow from Sydney Airport

Market Access Status
China-Australia FTA 2015

02. JAPAN

127m
Population

6
Total runways over 3km

260m
2018 value of export flow from Sydney Airport

Market Access Status
Japan Australia FTA 2015

03. SOUTH KOREA

52m
Population

4
Total runways over 3km

191m
2018 value of export flow from Sydney Airport

Market Access Status
Korea-Australia FTA 2014

04. INDONESIA

263m
Population

5
Total runways over 3km

80m
2018 value of export flow from Sydney Airport

Market Access Status
Indonesia-Australia Comprehensive Economic Partnership Agreement 2019

05. UNITED ARAB EMIRATES

10m
Population

12
Total runways over 3km

169m
2018 value of export flow from Sydney Airport

Market Access Status
Australia-GCC FTA negotiations

06. HONG KONG SAR

7.4m
Population

1
Total runways over 3km

1.3b
2018 value of export flow from Sydney Airport

Market Access Status
Australia-Hong Kong FTA 2018

07. SINGAPORE

5.6m
Population

3
Total runways over 3km

1b
2018 value of export flow from Sydney Airport

Market Access Status
Signapore Australia FTA 2003

2.1 China

China was identified as a result of its status as the top export destination for Australian agricultural produce, as well as its significant existing importation of NSW products, which totalled $9.62 billion in 2018. The market has the largest number of consumers globally at 1.4 billion people whom are also experiencing an increase in income and greater access to foreign agricultural produce, making them highly likely to demand quality produce from NSW.

Australia's FTA with China has unlocked further trade between the two countries, and investment into logistics in China, now ranked 26th globally for logistics performance, means that market access is increasingly efficient for air freight and related customs/regulatory processes.

Overall, China has significant infrastructure to be able to trade with NSW via air freight. Alongside investment into new airports, which cover various regions across China and provide broad access to each province, China has invested in cold chain development which will enable enhanced future fresh produce trade.

There are 14 major Chinese airports with capabilities to service wide-body aircraft such as; Beijing Capital Airport, Shanghai Pudong Airport, Guangzhou Baiyun Airport and Shenzhen Baoan Airport.

Core opportunities for New South Wales

Size of market

The world's largest population, which represents an opportunity for high volume fresh exports.

Consumer income growth

Driving demand for high quality, imported products from a growing middle class. Australian agriculture is seen as trustworthy, and premium.

Market access protocols

Improved market access for fresh produce and air freight transit through the China-Australia FTA.

Air freight supply chain capacity and capabilities

463 (2017)
NUMBER OF AIRPORTS

23.32
MILLION TON-TO-KM (2017)
Total air freight

71 (2017)
TOTAL RUNWAYS OVER 3KM LONG
(to support long haul freight services)

105
MILLION METERS CUBED CAPACITY IN 2018. **Ranked 4th best equipped for cold chain trade (2016).**

2.2 Japan

Japan was identified as a result of its longstanding trading relationship with NSW, with goods worth $13.8 billion imported by Japan in 2018. The market also has a large consumer population of 127 million, who enjoy high average incomes and are able to afford premium quality fresh produce.

Though economic growth indicates a minor slowdown of the economy, the Japan-Australia FTA has created new trading relationships and there is potential for NSW to further develop its exports to the nation, in new product areas including across agriculture. This has significantly facilitated market access, alongside Japan's strong international and domestic distribution capabilities, rated 5th in the world and ensuring smooth trade in goods via air freight. Trading with Japan is thus efficient, meaning that fresh product quality can be maintained through speed and assurance of the import process. Japan's airports are located as to provide access to the majority of the population. With strong logistics and cold chain capabilities, there is advanced access for fresh produce from NSW. Japan has six runways over 3km long, as well as another 45 that are between 2.4km and 3km in length, as of 2017. There were also 25 registered airlines with the Japanese Aviation Bureau at this time.

There are four airports classified as 'Class 1' by the Japanese Ministry of Land, Infrastructure and Transport (Osaka has been included within Kansai Airport). These airports are considered the main hubs for international air transport and thus represent the greatest opportunity for direct air freight from NSW.

Core opportunities for New South Wales

Need for agricultural imports

Small land size and agricultural sector, requires imported agricultural products to meet demand of large population.

Consumer wealth

Wealthy average consumer, able to afford premium fresh products.

Strong logistics capability

Advanced cold chain and air freight capabilities, improving access for NSW produce.

Air freight supply chain capacity and capabilities

175 (2013)
NUMBER OF AIRPORTS

10.69
MILLION TON-TO-KM (2017)
Total air freight

6 (2017)
TOTAL RUNWAYS OVER 3KM LONG
(to support long haul freight services)

38
MILLION METERS CUBED CAPACITY IN 2018 **Ranked 8th best equipped for cold chain trade (2016).**

2.3 South Korea

South Korea was identified as it meets each of the eight criteria as an attractive market for NSW. South Korea is home to over 52 million consumers, with an average income of US$29,742 per year. This means that it represents a significant market for NSW agricultural products, and Korean consumers who are able to afford premium goods.

The economy is growing, and the Korea-Australia FTA has improved access for agricultural product trade. South Korea is ranked 25th globally for logistics performance, also meaning food supply chain quality assurance is high and NSW produce is likely to maintain its freshness and premium positioning during transit.

Korea's airports are located in close proximity to the major urban population hubs – offering access to consumers.

Large cold storage capabilities facilitate fresh produce trade, alongside 4 runways over 3km long and 23 runways in total over 2.4km in length, enabling wide-body aircraft to land (Central Intelligence Agency, 2019).

Though Korea has eight main international airports, there are four which dominate freight and passenger transportation according to Korea Airport Corporation's statistics including Incheon, Gimpo, Gimhae and Jeju.

Core opportunities for New South Wales

Stable, significant market size

The market is growing sustainably, with a steady projection through to 2030. Korea will likely be a consistent trade destination.

High income consumers

Korean consumers have a high average income across the large population – driving demand for premium imported products.

Existing market access

Advanced logistics capabilities and free trade access for Australian products makes trade with Korea efficient and cost-effective.

Air freight supply chain capacity and capabilities

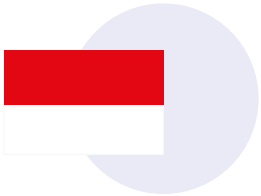
111 (2017)
NUMBER OF AIRPORTS

11.00
MILLION TON-KM (2017)
Total air freight

4 (2017)
TOTAL RUNWAYS OVER 3KM LONG
(to support long haul freight services)

12
MILLION METERS CUBED CAPACITY IN 2018

2.4 Indonesia



Indonesia was identified due to its large population and proximity to Australia. 263 million people live within a seven hour flight of Sydney, who are growing in income and are increasingly able to afford premium agricultural products from Australia.

Despite small existing trade flows between NSW and Indonesia, the recently concluded FTA between Australia and Indonesia is expected to open up trade significantly, and assist with realising some of the US$3.2 billion of untapped Australian export potential to the market. The economy is growing, there is strong air freight access from NSW into the market, and the sheer number of people in Indonesia makes it a significant market opportunity.

Indonesia has a large number of airports, however the majority of these are regional facilities to service rural and island-based communities, and there are only 186 paved runways in total. There are only 5 runways of over 3km in length, however there are a further 21 that are between 2.4km and 3km (Central Intelligence Agency, 2019). However, aviation is expected to grow to become the 6th largest air transport industry globally by 2034, whilst Australia's proximity to Indonesia will also facilitate direct flights to the country.

Despite 19 airports in Indonesia operating scheduled international routes, Soekarno-Hatta Airport in Jakarta and Denpasar Ngurah Rai Airport in Bali operate 44% and 34% of these routes respectively. Surabaya, Medan, and Bandung are secondary airports, accounting for 6%, 7% and 2% of 2017 international route capacity respectively (Central Intelligence Agency, 2019).

Core opportunities for New South Wales

Size of population

An extremely large population with a growing middle class, offering a diverse and significant consumer market size for NSW products.

Proximity

NSWs' closest Asian market, there are multiple direct flights and quality of fresh produce can be maintained.

Developing trade relationship

A concluded FTA to come into force is expected to enhance Australian market access, especially in agriculture.

Air freight supply chain capacity and capabilities

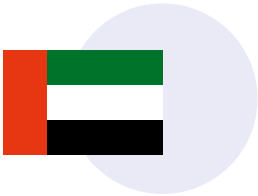
670 (2017)
NUMBER OF AIRPORTS

1.06
MILLION TON-TO-KM (2017)
Total air freight

5 (2017)
TOTAL RUNWAYS OVER 3KM LONG
(to support long haul freight services)

3.87
MILLION METERS CUBED CAPACITY IN 2018 **Ranked 7th globally for cold storage capabilities in (2016).**

2.5 United Arab Emirates



UAE was identified as it has the potential as both a market and as a hub to unlock access to the wider Middle East region. The UAE has a small population, however the average citizen is highly wealthy with a GDP per Capita of US$40,698, meaning they demand high quality imported agricultural products. There is limited existing trade with NSW, however an untapped potential of US$1.7 billion for Australian exports means that there is a large potential gain.

Furthermore, the market has a modern logistics system, ranked 11th globally, and operates global aviation hubs at Dubai and Abu Dhabi, making access efficient and direct. The UAE represents an opportunity to access the wider Middle Eastern region, through using UAE as a consolidation point to then distribute regionally.

There are five main airports monitored and reported on by the UAE's General Civil Aviation Authority including Abu Dhabi, Dubai, Sharjah, Ras Al Khaima and Fajairah. The former two are by far the largest by flight arrivals and departures.

Core opportunities for New South Wales

Strong logistics capabilities

Rated high in logistics capabilities compared to other markets, with advanced ability to handle fresh produce.

Significant consumer incomes

Wealthy population who demand premium product, and are used to international agricultural goods.

Access to a regional hub

Offers a broader opportunity to access the wider region, and further onto Europe, due to its role as a transport hub.

Air freight supply chain capacity and capabilities

43 (2013)
NUMBER OF AIRPORTS

16.52
MILLION TON-TO-KM (2017)
Total air freight

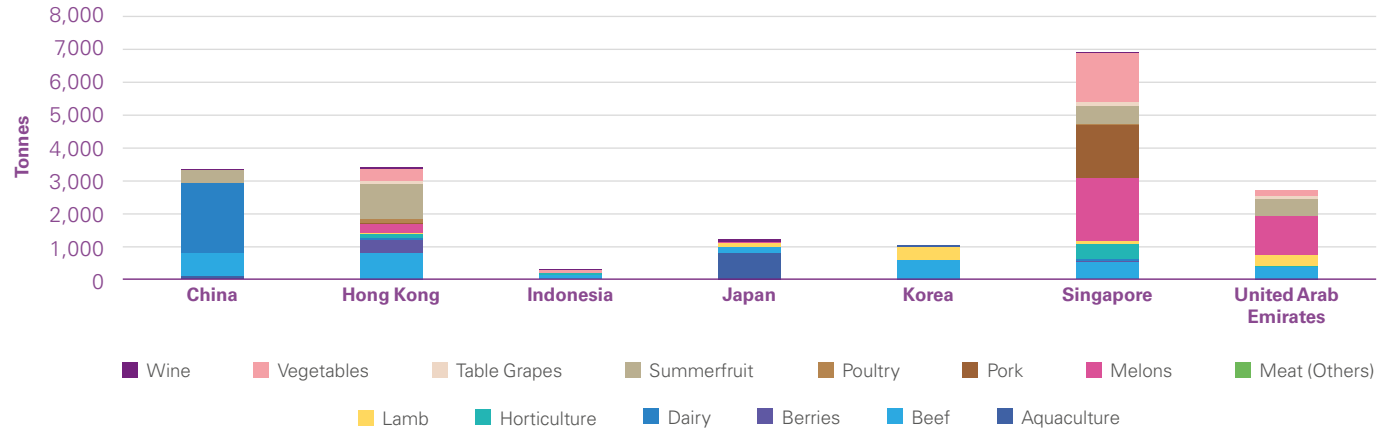
12 (2013)
TOTAL RUNWAYS OVER 3KM LONG
(to support long haul freight services)

Ranked 16th globally for cold chain capabilities in 2016. Significant investment is being made.

3. What are the key high value perishable agricultural products suitable for air freight export?

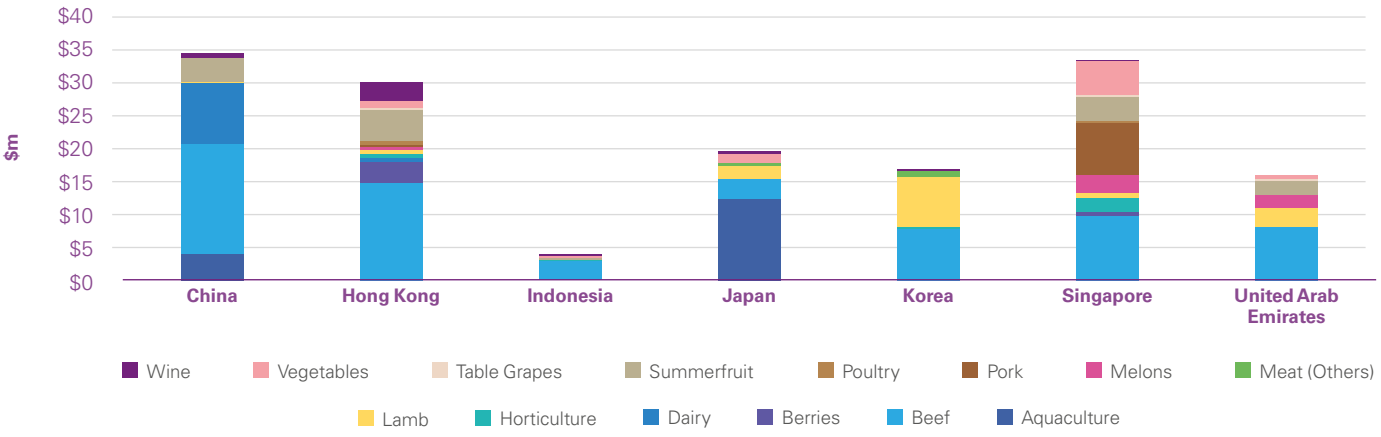
For the five international markets (China, Japan, South Korea, Indonesia and UAE) and two export hubs (Singapore and Hong Kong), a long list of 14 potential perishable air freight export products were identified taking into account historical air freight export volumes and values.

Volume of air freight export of products produced in NSW for selected markets - 2018



Source: (ABS, 2019)

Value of air freight export of products produced in NSW for selected markets - 2018



Source: (ABS, 2019)

In 2018, the top six highest total value perishable agricultural air freight export products from NSW included:

- Beef
- Summerfruit
- Pork
- Lamb
- Aquaculture
- Dairy

These products are both of high value and high volume and it was agreed they would form the basis of the more detailed analysis in the pre-feasibility. Other products may be added for detailed analysis in subsequent phases including the Business Case. Additional products that are not currently exported via air freight in high volumes but exhibit potential include vegetables, citrus, melons, berries, table grapes and nuts.

Overview of agricultural products

BEEF

$2.4b
Gross value of NSW production

$65m
Total Air freight export from NSW to the five target markets & two hubs

China
Largest international air freight export market in 2018 (by value)

3%
Average consumption growth rate for priority markets

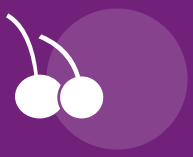
LAMB

$833m
Gross value of NSW production

$13.8m
Total Air freight export from NSW to the five target markets & two hubs

South Korea
Largest international air freight export market in 2018 (by value)

5%
Average consumption growth rate for priority markets



SUMMERFRUIT

$51m
Gross value of NSW production

$13.9m
Total Air freight export from NSW to the five target markets & two hubs

Hong Kong
Largest international air freight export market in 2018 (by value)

7%
Average consumption growth rate for priority markets

Key NSW agricultural products include beef, lamb, pork, summerfruit, dairy and aquaculture.

PORK

$224m
Gross value of NSW production

$9m
Total Air freight export from NSW to the five target markets & two hubs

Singapore
Largest international air freight export market in 2018 (by value)

3%
Average consumption growth rate for priority markets

DAIRY

$549m
Gross value of NSW production

$11.0m
Total Air freight export from NSW to the five target markets & two hubs

China
Largest international air freight export market in 2018 (by value)

7%
Average consumption growth rate for priority markets

AQUACULTURE

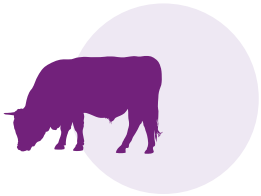
$66m
Gross value of NSW production

$16.7m
Total Air freight export from NSW to the five target markets & two hubs

Japan
Largest international air freight export market in 2018 (by value)

3%
Average consumption growth rate for priority markets

3.1 Beef



Beef is NSW's largest air freight export product to the high priority markets by both volume and value. Significant consumption of beef exists in Japan and Korea, while demand for beef is growing by up to 15% in China, Indonesia and the UAE.

Australian and NSW beef products are considered market leading in many of the target markets, known for the quality, freshness and safety of the meat.

There are typically four types of beef export products including fresh carcasses, fresh cuts (bone in), fresh cuts (boneless), and fresh offal. Beef represents a significant opportunity both in the near and longer terms for NSW.

Key metrics for New South Wales air freight trade

$64.5 million / 3,237 tonnes

Existing demand across target markets and hubs (air freight imports from NSW, 2018) which represents an opportunity for high volume fresh exports.

3%

Predicted average annual growth rate across the seven markets

$92.06 million / 4,615 tonnes

Projected 2030 demand across target markets and hubs (value / volume, if average growth maintained)

Other Australian export considerations

EXISTING DEMAND

- 70% of Australian beef exports to Japan are channelled to food service, whilst 50% in Korea are through retail and 70% in China for processing.
- Manufacturing, briskets and loins are the most highly traded cuts to Japan, whilst chuck roll, blade and brisket are the largest to Korea. China demands brisket, manufacturing and shank.

FUTURE DEMAND

- Per capita consumption of beef is expected to stay stable in Japan and Korea, and continue to increase by over 15% per annum in China.
- Maintaining brand loyalty and consumer trust for Australian product will be crucial.
- $1.4 billion of unmet demand for Australian beef across the target markets – representing a significant opportunity to grow trade from NSW.

There were 15,259 businesses dealing in beef livestock in NSW in 2016-2017, with overall stock around 5 million meat cattle, and slaughtered meat worth $2.4 billion in total.

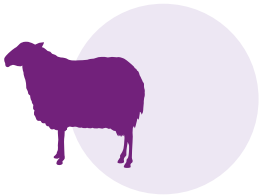
NEW SOUTH WALES ADVANTAGE

- Premium reputation of Australian beef in Asian markets. The 'True Aussie Beef' logo is trusted by consumers.
- Strong capability to meet import requirements, including halal for the UAE and Indonesia.
- Competition largely from USA, Brazilian and Indian beef.

MARKET ACCESS

- 12-25% of tariffs eliminated by 2024 in China.
- Japan tariffs on chilled produce will fall from 38.5% to 23.5% by 2030, however strict quotas will apply.
- South Korea 40% tariff eliminated by 2028.
- Indonesia tariffs eliminated by 2020. However strict permit requirements.
- UAE tariffs between 0% and 5%.

3.2 Lamb



Lamb has consistently been a major export agricultural product for NSW. Lamb is experiencing similar trends to beef that are driving demand, and consumers in target markets appreciate the high quality of NSW lamb. Tariffs have been falling in international markets with the signing of FTA's, providing enhanced access for Australian products.

Demand is especially high in the UAE with 10.7kg per capita consumption in 2018, as lamb forms a central role in regional diets. Also, Australia represents up to 98% of Indonesian lamb imports and 94% in Korea – meaning that product reputation and trading channels are established and ready for expansion as demand continues to grow.

Key metrics for New South Wales air freight trade

$13.85 million / 942 tonnes

Existing demand across target markets and hubs (air freight imports from NSW, 2018) which represents an opportunity for high volume fresh exports.

5%

Predicted average annual growth rate across the seven markets

$24.87 million / 1,691 tonnes

Projected 2030 demand across target markets and hubs (value / volume, if average growth maintained). Market access for target markets

Other Australian export considerations

EXISTING DEMAND

- Shoulder lamb represents the most popular cut in Japan (42%) and Korea (47%), breast (51%) in China, and carcass in the Middle East (71%).
- In Asia, lamb is more demanded in restaurants – 65% of lamb in China is consumed out of home.
- Per Capita consumption is high in the UAE - 10.7kg (2018) compared to 4.6kg in China, 300g in Japan and 200g in Korea.

FUTURE DEMAND

- In each of the markets other than China, imported lamb services the majority of demand – this is expected to continue.
- Per Capita consumption is expected to rise in all of the markets by 2022 – including growth to 5.1kg in China.
- While lamb constitutes a lower share of total meat consumption across Asia, demand is increasing strongly.

In 2016-2017 there was a total stock of 27 million lamb and sheep in NSW. These were owned and operated by approximately 11,806 businesses in the industry, which was worth $832.5 million.

NEW SOUTH WALES ADVANTAGE

— Producers are well placed to meet the cited purchase criteria of international consumers – quality/taste in North Asia, religious compliance in South Asia and the UAE.

— Australia has significant market share – 60% of Japanese imports, 94% for Korea and 98% for Indonesia – providing NSW producers established end user opportunities.

MARKET ACCESS

— China levies tariffs between 6.7% and 10.2%, however will be 0% by 2023.

— There are no tariffs/ quotas to Japan.

— Tariffs to Korea will drop from 9% to 0% in 2023.

— Indonesia tariffs will be cut from 5% to 0% following the FTA. Halal requirements exist.

— The UAE has a number of technical conditions for entry, though 0% tariffs for chilled and carcasses, and 2.5%-5% for other cuts.

3.3 Summerfruit

Improvements in market access to North Asia, including a market protocol for China, has unlocked demand for summerfruit (stone fruit). The quality, flavour and trustworthiness of Australian apricots, cherries, nectarines, peaches and plums is recognised by global consumers.

Growth rates for exports has been notable – cherry export volume and value increased by 44% and 67% respectively from 2017 to 2018. Tariffs have been lowered – eliminated in the cases of China, Japan and Indonesia, whilst some summerfruit products have become engrained in regional cultures – cherries given as holiday gifts in China for example, and first boxes seen as prestigious.

Therefore, having been a marginal export category just five years ago, summerfruit is now a significant horticultural export overall. It should be noted that summerfruit production is seasonal in nature and primarily occurs over the summer months.

Key metrics for New South Wales air freight trade

$13.99 million / 2,527 tonnes

Existing demand across target markets and hubs (air freight imports from NSW, 2018) which represents an opportunity for high volume fresh exports.

7%

Predicted average annual growth rate across the seven markets

$31.52 million / 5,691 tonnes

Projected 2030 demand across target markets and hubs (value / volume, if average growth maintained). Market access for target markets

Other Australian export considerations

EXISTING DEMAND

- 16% of Australian cherry exports in 2017-2018 were to China. 30% of nectarines/peaches land in China, and 19% of plums.
- The UAE is a significant apricot market, representing 16% of exports in 2017-2018.
- Singapore and Hong Kong are large hubs – representing over 10% of exports across each category, and 39% for plums.

FUTURE DEMAND

- Summerfruit exports (excluding cherries) from Australia grew by 27% in volume and value from 2017 to 2018.
- The export value and volume of Australian cherries grew by 44% and 67% respectively last year.

There were 285 agricultural businesses related to the summerfruit industry in NSW as of 2016-2017, operating across the apricots, cherries, nectarines, peaches and plums categories. Overall, there was nearly 7 million kilograms of summerfruit produced in NSW, worth a total of $50.7 million. The Riverina and Central Tablelands dominate production by volume.

NEW SOUTH WALES ADVANTAGE

- Cherries from Australia in particular are viewed as the best on the market in China and North Asian countries. Sales prices are extremely high.
- Summerfruit are NSW's fifth largest horticultural export – worth $18.7 million in 2017-2018.
- Central Tablelands and the Riverina region are major production hubs for summerfruit.

MARKET ACCESS

- Market access was achieved for China in 2016, eliminating tariffs in 2019.
- Japan tariffs were eliminated with JAEPA, with cherries reduced to 3.4%.
- South Korea has reduced tariffs from 45% to 6.4% in 2019 for apricots, 18% for peaches/nectarines/plums. Cherry tariffs are 0%.
- Indonesia tariffs have been eliminated from the previous 5%, following AANZFTA.

3.4 Aquaculture

Air freight is important in the delivery of fresh aquaculture given its short window of freshness. Australia has market access protocols in place for the majority of aquaculture products to be able to enter the target markets. Tariffs have also fallen considerably, pointing to opportunities for NSW to meet the significant demand growth expected in the near future.

Demand for aquaculture in the target markets is made up of molluscs, invertebrates, tuna, skipjack, stipe-bellied bonito fresh, chilled and crustaceans.

Key metrics for New South Wales air freight trade

$16.73 million / 827 tonnes

Existing demand across target markets and hubs (air freight imports from NSW, 2018) which represents an opportunity for high volume fresh exports.

3%

Predicted average annual growth rate across the seven markets

$23.86 million / 1,179 tonnes

Projected 2030 demand across target markets and hubs (value / volume, if average growth maintained). Market access for target markets

Other Australian export considerations

EXISTING DEMAND

- Tuna was NSW's largest seafood export in 2016-2017 – worth $9.4 million. Abalone and Prawns were valued at $2.1 million and $1.2 million respectively.
- China, Hong Kong, Japan and Vietnam represent major markets for Australian seafood – over 4,000 tonnes shipped to each market in 2016-2017.

FUTURE DEMAND

- Global per capita consumption of seafood is expected to grow to 20.9kg in 2023, driven by growth in Asia.
- Strong seafood cultures, especially in Japan, are likely to result in stable demand growth. Consumption of tuna and salmon grew by 40% in Japan between 2001 and 2014.
- Consumption channels are changing – 41% of consumers in Korea purchase from markets, however 39% also now buy at supermarkets.

NSW aquaculture is located on the eastern coastline, with many fisheries operating in nearby estuaries. Inland fisheries are becoming more prominent, alongside traditional ocean/coast-based aquaculture.

NEW SOUTH WALES ADVANTAGE

— In 2016-2017, oysters, rock lobster and king prawns were the highest value catch in NSW. These are premium, high value products that are growing in demand in target markets.

— Ocean contamination is growing demand for certified, clean products - Australian seafood has this reputation.

MARKET ACCESS

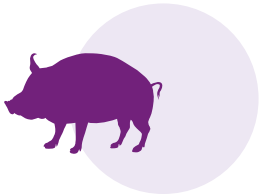
— Tariffs on most categories in China have reduced from 10% to 0% in January 2019.

— The majority of tariffs to Japan have reduced from 3.5% to lower levels since the FTA.

— South Korean tariffs have been eliminated from around 20%.

— Indonesia tariffs of 5% have been eliminated with AANZFTA to reduce barriers to entry.

3.5 Pork



Australian pork is considered to be high quality and pork has consistently been a high value air freight export for NSW. International consumers are increasingly demanding higher quality pork as incomes rise – making Australian products attractive.

Key metrics for New South Wales air freight trade

$9.02 million / 1,734 tonnes

Existing demand across target markets and hubs (air freight imports from NSW, 2018) which represents an opportunity for high volume fresh exports.

3%

Predicted average annual growth rate across the seven markets

$12.87 million / 2,472 tonnes

Projected 2030 demand across target markets and hubs (value / volume, if average growth maintained). Market access for target markets

Other Australian export considerations

EXISTING DEMAND

- Singapore and Hong Kong are two of the major destinations for Australian pork – which can then access surrounding markets. Last year the value of total Australian pork exports to these markets was $66.8 million and $11.8 million respectively.
- Ribs and belly cuts are most highly demanded in the Chinese market, followed by shoulder and legs.

FUTURE DEMAND

- Pork is the most consumed meat across the world – it forms a key part of many diets and its versatility means it is used by different types of consumers. These trends are expected to further develop.
- As international consumers achieve higher incomes, they are shifting to higher-cost pork from Australia and Europe, compared to low cost from Brazil.

There were 325 businesses in NSW in 2016-2017 operating in pork production. Cumulatively, these produced more than $224 million of pork, with a stock of 512,389 pigs.

NEW SOUTH WALES ADVANTAGE

— Similar to other meats, Australia has a reputation of provenance and clean, green, product that can be utilised for pork export sales.

— 85% of surveyed Chinese importers demand Australian pork – citing safety and natural attributes as key factors.

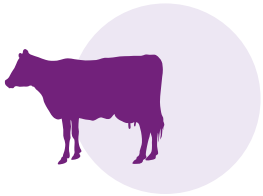
MARKET ACCESS

— China's 20% tariff on pork products was eliminated from January 2019.

— Japan has base rate tariffs on pork, calculated depending upon difference between tariff and customs duty.

— South Korea will eliminate tariffs in 2028 from current levels of 13.5% on chilled pork. Fresh carcasses and hams/bone-in cuts have no tariff, frozen do.

3.6 Dairy



In recent years an air freight based market for fresh milk has emerged out of NSW. Provenance and quality are specific consumer criteria in export markets given recent food safety challenges, with premium Australian dairy well regarded and trusted by consumers.

Growth is particularly expected in China and Indonesia given dairy exports to the former have increased by 164% since 2013/14. Dairy has tended to be a challenging category for market access, with high tariffs still affecting trade to Korea and Japan, however dietary changes across the region is leading to rapid and notable demand potential for NSW industry.

Dairy is a diverse category, with NSW exporting both fresh dairy products and cheeses, creams and yoghurts. Consumers in the target markets, particularly Asia, are increasingly demanding dairy based products, with their diets adapting and dairy being a core nutritional trend.

Key metrics for New South Wales air freight trade

$11.04 million / 2,637 tonnes

Existing demand across target markets and hubs (air freight imports from NSW, 2018) which represents an opportunity for high volume fresh exports.

7%

Predicted average annual demand growth rate across the seven markets

$24.87 million / 5,939 tonnes

Projected 2030 demand across target markets and hubs (value / volume, if average growth maintained). Market access for target markets

Other Australian export considerations

EXISTING DEMAND

- Cheese is the largest dairy export to Japan (83% of value) and Korea (40%), while infant powder is highest in China and Indonesia (46% and 61%).
- Food safety incidents and changing diets in target markets are driving demand. Fresh dairy is in particular demand for its health benefits.

FUTURE DEMAND

- There is a mixed trend in changing exports to the markets – Australia's China and Indonesia exports between 2013/14 to 2017/18 have grown by 164% and 21% respectively, however Japan and Korea have experienced declines.
- Dairy has traditionally been protected for trade – future growth will depend upon removal of technical barriers and protectionism.

In 2016-2017, there were 1,159 businesses relating to dairy cattle management in NSW. These produced a cumulative total of $548 million worth of milk in the year, across a 294,892 herd of dairy cattle.

NEW SOUTH WALES ADVANTAGE

— Consumers increasingly demand fresh rather than long-life dairy – NSW is within direct flights of these markets.

— New Zealand, the EU, and North America are major competitors. However, compliance and quality of products are significant selling points and Asian consumers in particular appreciate the provenance of Australian dairy.

MARKET ACCESS

— China levy 9% tariffs on fresh milk/cream, and 3% to 7% on cheese.

— Japan has tariffs of 25% for fresh milk/cream, and 29.8% for fresh cheese.

— South Korea has a 20% tariff on milk/cream, and between 27.6% and 30% for cheeses.

— Indonesia tariffs range between 0% for cheese and 5% for milk/cream.

— Tariffs for the UAE and gulf region are generally 5% for dairy.

3.7 Additional products for consideration

Products that may not have the highest total volume, may still be high value and hence should still be considered. Additional products include citrus, berries, nuts, table grapes, melons, avocados and other vegetables (such as broccoli).

Factors driving growth potential

Citrus

- Diversity of production in NSW offers a range of opportunities – produce includes common oranges, valencia, navel oranges, and eureka lemons.
- Target markets play a large role in exports. 63% of exported grapefruit from Australia in 2017-2018 was to Japan, 68% of lemons/limes were to Indonesia, 30% of mandarins were to China, and 46% of oranges were to China/Japan. There have been improvements in market access improvements.

Berries

- Berries are typically a high value export product. Export focus is on priority and hub markets. Hong Kong represented 47% of Australian exported blueberries in 2016-2017, with Indonesia, the Middle East and Singapore also imported significant quantities.
- Approximately 75% of Australian blueberries are produced in the North Coast region of NSW, with the state also producing other berry varieties. There are over 100 growers in this region alone.

Nuts

- NSW is the largest producer of hazelnuts (44%), pecans (84%), pistachios (40%) and walnuts (74%) in Australia.
- International demand has varied per nut variety – exports in walnuts grew by 43% in value between 2017 and 2018. Diversification is thus possible for producers.
- Value of exports across nuts are expected to significantly grow by 2025. Almonds and macadamias are anticipated to increase by 38% and 37% respectively.

Table Grapes

- In 2017-2018, China represented 38% of Australian table grape exports, while Indonesia and Japan represented 15% and 10% respectively. Market access in 2014 has increased potential for trade.
- Other than WA, NSW is the only growing region to have increased exports in both 2017 and 2018 – indicating a developing role of NSW as a key exporter.

Melons

- Melon exports from Australia have grown each year since 2013 – increasing by almost 72% during this time.
- The UAE is a major export destination – for 22% of musk melons and 49% of watermelons. Melons are a category where NSW could specifically target demand in a particular region. There was 1,888 tonnes of melon exports to Singapore in 2018, the largest volume destination market.

Vegetables

- The range of categories within vegetables means that NSW producers can be flexible to meet future demand. NSW is a major producer of cabbages (26% of national total), cauliflower (14%), eggplant (22%), garlic (30%), Asian vegetables (43%), mushrooms (31%), pumpkin (28%), sweetcorn (24%), and zucchini (19%).
- Vegetable exports from Australia have grown in value since 2016, despite volumes not increasing. This suggests prices have risen, and NSW producers can thus yield greater margins.

Source: (Horticulture Innovation Australia, 2017/18)

3.8 Future demand projection for priority perishable products

A projection of the future demand for the six key products identified was undertaken. The projection was based on the import demand for these products from the target markets. Given the pre-feasibility nature of the study, the forecast has been prepared as a high level indication only.

The average demand for the six products in the target markets is as follows:

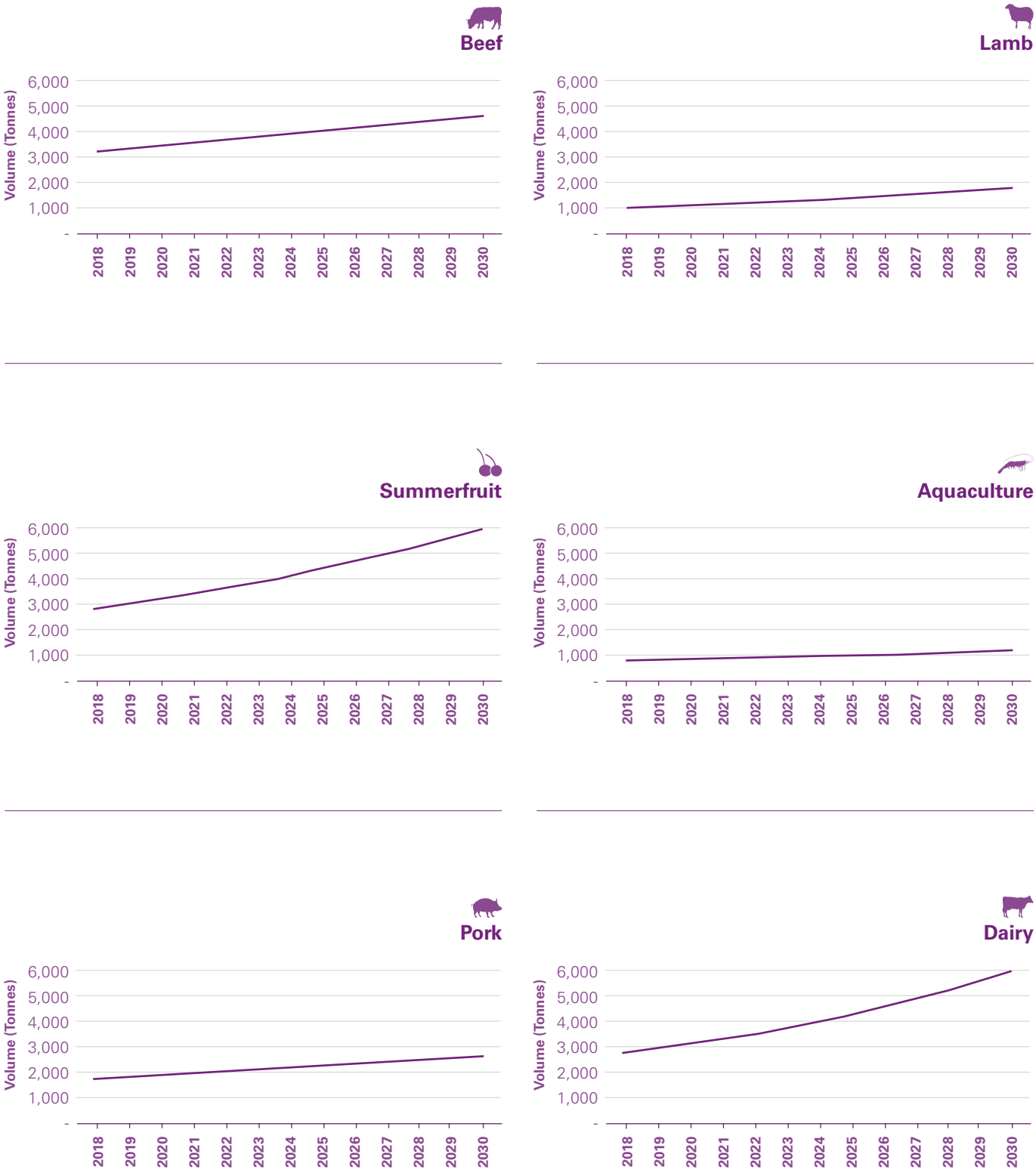
Beef 3% p.a.	**Aquaculture** 3% p.a.	**Lamb** 5% p.a
Summerfruit 7% p.a.	**Dairy** 7% p.a.	**Pork** 3% p.a.

The 10 year forecast demand t for the priority products is shown in the table below. Based on current volumes of the products identified, beef is the state's largest air freight export (by volume).

The projection is based on the status-quo and does not incorporate any additional or new demand (fresh perishable production) that may be stimulated from improvements in air freight connectivity in regional NSW. Seasonability has also not been taken into account. Investigation of the stimulatory effect and seasonality will be a focus for the next phase of the study.

Future demand projection for priority perishable products (volume)

Figure 1: Volume projections for NSW top air freight exports to target markets and hubs, 2018-2030



4. What are the key requirements to develop a regional air freight supply chain in NSW?

The key requirements to develop an export supply chain of perishable products needs to consider factors from farm gate to consumer, with each segment of the supply chain playing its role to reinforce efficient outcomes. Regional air freight supply chains involve both infrastructure as well as regulatory requirements. These include airport infrastructure, dedicated cold chain, and air freight cargo facilities. All perishable exports also must comply with both Australian export and destination country import rules. Although there are many requirements, the pre-feasibility study has focussed on the infrastructure associated at airports.

4.1 Airport infrastructure requirements

The capability of different types of aircraft to operate at an airport is determined by several infrastructure criteria, including (but not limited to) runway length, width and strength; suitable aprons and taxiways; and aviation equipment suitable to specific aircraft types.

Performance parameters of aircraft vary, even between models of the same aircraft series. The required runway length for take-off will be calculated according to several criteria including aircraft type, the engines fitted, take-off weight, ambient temperature and relative humidity, elevation of the airport, presence of wind, gradient of runway and whether the runway is wet or dry.

Australia has adopted the International Civil Aviation Organisation (ICAO) methodology of using a code system, known as the Aerodrome Reference Code, to specify the standards for individual aerodrome facilities which are suitable for use by planes within a range of performances and sizes. The Code is composed of two elements: element one is a number related to the aeroplane reference field length; and element two is a letter related to the plane wingspan (noting that the determination of the aeroplane reference field length is solely for the selection of a Code number and must not be confused with runway length requirements, which are influenced by other factors) (Australian Civil Aviation Safety Authority, 2019).

The runway length must be adequate to meet the operational requirements of planes approved to operate there. When environmental variations occur, the payload weight may need to be reduced for safe take-off.

Table 1 provides a summary of several common freight aircraft (and a common international passenger aircraft) with the range for minimum take-off runway lengths when fully loaded, along with the applicable flying distance.

There are two potential operating models which will dictate the required upgrades to potential runways in regional NSW. A direct freighter model is based on an international direct freight service from regional NSW to an export market, requiring long range aircraft.

An alternative model is to operate a hub and spoke model where freight from regional centres is moved through an existing export gateway airport. For instance, this could include Sydney Airport or the future Western Sydney Airport in NSW. Other major gateways for a hub and spoke operation could include Melbourne and Brisbane. This is further discussed in Chapter 5.

Typical dedicated freighter aircraft that could operate under a hub and spoke model include the B737 and the A321. Qantas recently announced that it would undertake a passenger to freighter conversion of a number of A321 aircraft which will be introduced into Qantas' freight business in 2020.

For direct freighter services from a regional location to an overseas market, larger aircraft with longer range is required. The majority of air freight exported and imported into Australia is used in the belly space of wide bodied aircraft such as the A330.

Table 1: Aircraft specifications for air freight

	Range (fully loaded)	Maximum Take-off Weight	Take off Runway (approx.)	Maximum Revenue Payload	Cubic Cargo Volume	Aerodrome Reference Code
Aircraft type	**km**	**tonne**	**m**	**tonne**	**m3**	**code**
Suitable for hub and spoke to a domestic airport						
B737-400SF (freighter)	3,028	63	2,300-3,000	17	130	4C
B737-400SF (freighter)	3,028	63	2,300-3,000	20	140	4C
A321 (freighter)[a]	4,260	94	2,300-3,000	28	208	4C
Suitable for direct freighter service to an international market						
B767-300 (freighter)	6,025	185	2,700-3,400	54	438	4D
A330-200 (freighter)	7,400	233	2,400-3,000	70	136	4E
A330-300 (passenger)	11,750	242	2,300-3,100	21	86	4E
B747-8F (freighter)	7,500	442	3,100-3,500	131	873	4F
B777F (freighter)	8,000	347	2,800-3,100	103	633	4E
B747-400 (freighter)	13,380	396	3,200-4,000	112	765	4E

a Passenger converted freighter

4.2 Cargo Terminal Facilities

The overall purpose of the air cargo terminal facility is to manage the flow of freight between aircraft and land freight (i.e. trucks) and validate that consignments are authorised to move for both export and import. An overview of a typical air cargo facility is shown in the figure below.

The typical export activities that would occur at the air cargo facility include:

- receiving freight in Unit Load Devices (ULDs) already pre-packed by shipper or forwarder
- receiving loose loads to be consolidated into ULDs
- carrying out screening, weighing etc
- transferring to tug and dolley chains to move to aircraft.

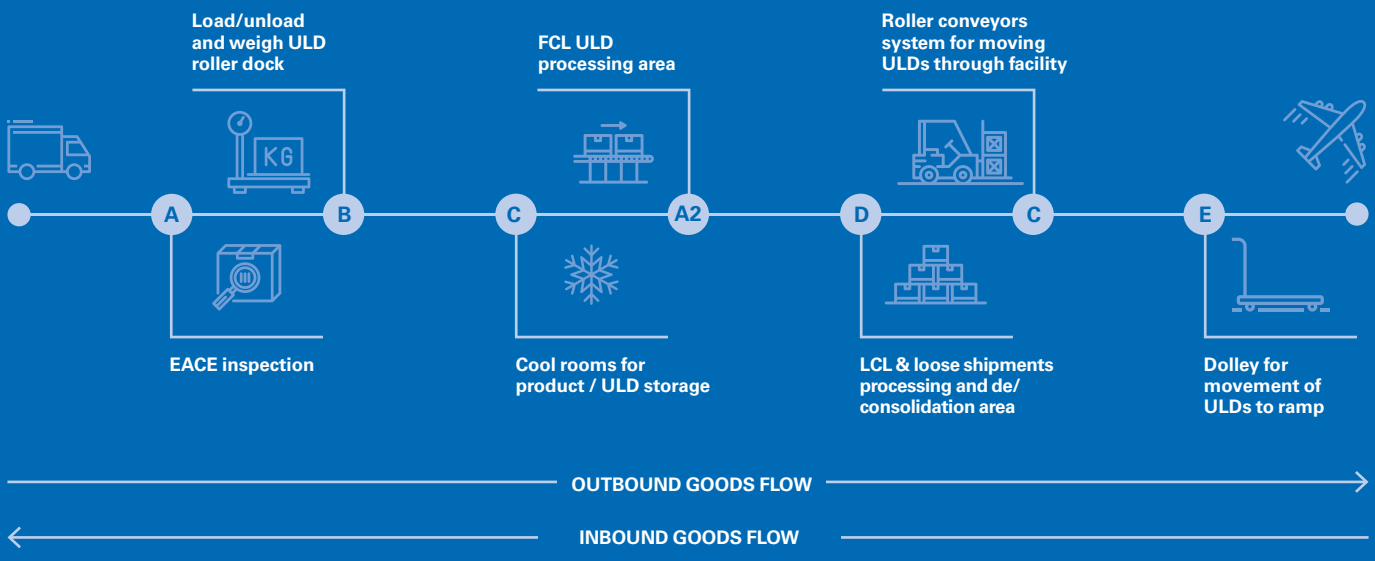
The import process is almost a mirror image of the export flow.

ULDs are handled at ground level on roller conveyors and other specialised equipment. Larger facilities may store ULDs off the ground to maximise facility footprint utilisation. As ULDs are not usually suitable for forklift operations, specialised equipment for loading and unloading of freight to and from land freight vehicles is essential - along with conveyors/rollers – to maintain safe work practices.

Temperature controlled areas are required (not shown in the figure below) and the facility will have screening and security equipment. A quarantine area is required to temporarily hold shipments until release authority is provided by Customs and Border Protection authorities. The cargo terminal operator (CTO) is responsible to monitor the movement status for each consignment to ensure that such approvals are received before any cargo is moved through the facility.

To cater for direct and hub and spoke regional air freight exports in NSW, the potential airport locations will require an air cargo terminal facility.

Figure 1: Layout of a typical air cargo terminal facility



Primary Capabilities:

A: Storage and staging of agricultural commodities at appropriate temperature and humidity

A2: Controlled atmosphere storage and staging

B: Provide aviation security and biosecurity management (including EXDOC facilities, if required)

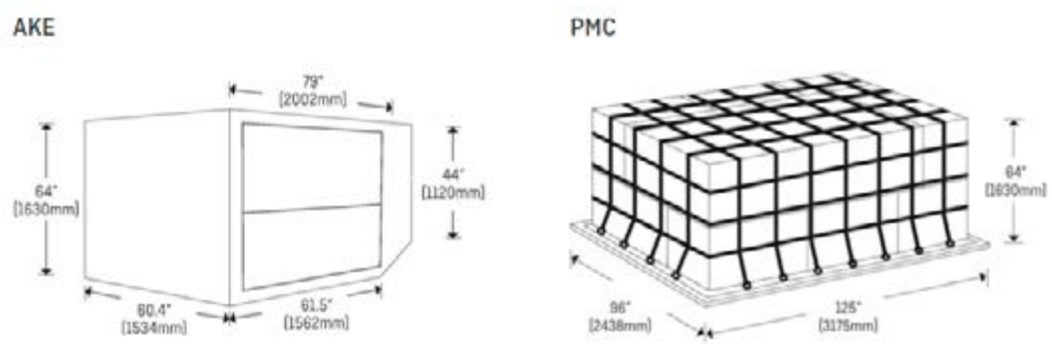
D: Pack agricultural products in air containers

C: Manage temperature control staging facility at airport

E: Transport air containers to and from ramp

Cargo Terminal Facilities (continued)

Example ULD's utilised across many airlines

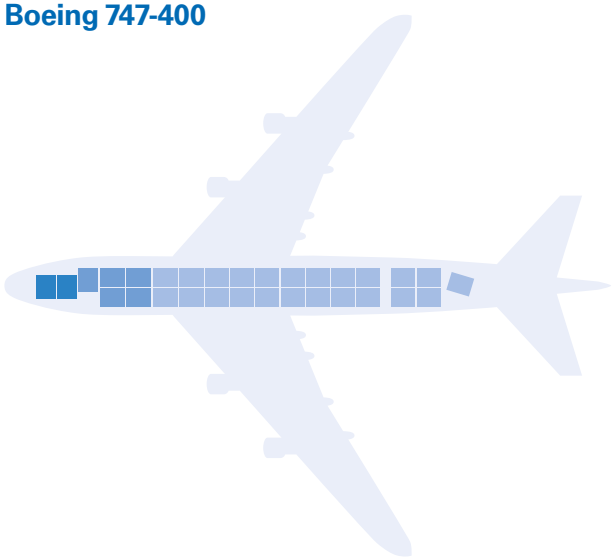


Air containers are usually packed locally in the vicinity of the airport, with the equipment being made available by the airline when the freight booking is confirmed. Consignments to be packed into (or onto) an aircraft ULD will generally be delivered to a freight forwarder for handling and packing. A 'Known Consignor' may also take this approach, or may pack the ULD themselves depending on their location and related transport costs for moving the ULDs (for example, certain fresh produce distributors located at Sydney Markets who are 'Known Consignors' may pack their own ULDs and transport the full unit direct to the CTO).

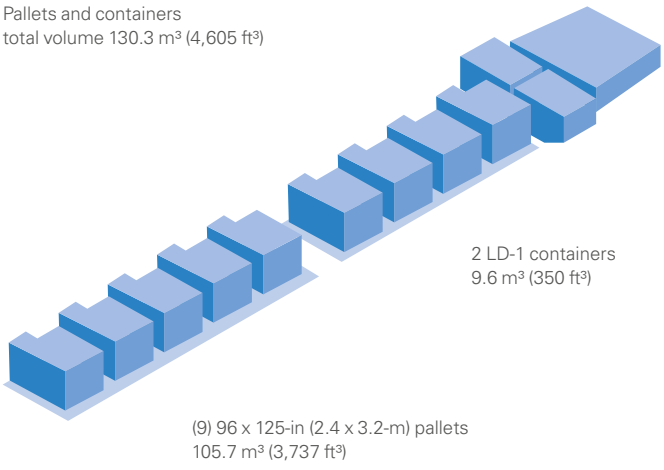
Where fresh produce is expected to be the predominant cargo handled through a freight terminal, the facility would require sufficient space to stage the ULDs intended for a full plane, with sufficient cool room space for the vast majority.

Using the 747-400 Freighter aircraft as an example, the plane may hold up to 112 tonne across 765 cubic metres. The cargo configuration of aircraft will vary, with different layouts and different ULD equipment used. One configuration used for the B747-400 as provided by Boeing, utilises a mix of 30 pallets (e.g. PMC) and containers (e.g. AMP) on the main deck (607.7m^3), plus on the lower deck mix of 9 PMC pallets and 2 AKE containers (130m^3, including additional bulk storage of 14.7m^3) (Boeing, 2019).

Main deck cargo configuration example Boeing 747-400



Lower deck cargo configuration example Boeing 747-400



(2) 96 x 125-in x 8-ft contoured pallets at 15.3 m³ and 17.2 m³ (540 ft³ and 607 ft³)
(5) 96 x 125-in x 8-ft pallets at 17.4 m³ (613 ft³)
(23) 96 x 125-in x 10-ft contoured pallets at 21.2 m³ (750 ft³)
(30) 96 x 125-in pallets positions

Total **607.7 ft³** **21,462 ft³**

The minimum area occupied by these 41 ULDs is over 300m^2, before adding space for manoeuvring, conveyor systems and equipment access. A CTO with sufficient cold storage facilities to support a freighter plane load of staged cargo would require a minimum of 1000 m^2, to include conveyor and roller systems in conjunction with other facility requirements. Available space for facility expansion is also essential for growth as flight frequency increases.

This estimate, assuming one 747 flight per week loaded at 100T, is based on the IATA Airport Development Reference Manual, which provides a ratio of Gross Floor Area to freight tonnage. Assuming predominantly manual operations (as opposed to full automation) the manual recommends 5 tonne of annual freight can be handled 1m^2 of floor area.

Where cargo may be loaded on passenger flights (rather than dedicated freighters), the facility size required considerably reduces. A facility handling 10-25 tonne of cargo per day may comfortably operate from a facility of around 400 - 500m^2.

4.2.1 Cold chain consideratons

Cold chain facilities are essential for the handling of perishable products for air freight export in order to prevent product wastage during storage and transportation.

To maintain cold chain integrity and minimise product damage, an air cargo facility primarily aimed at handling perishable products for air freight may include:

01. Refrigerated receiving dock at 12°C (receiving area to accommodate a range of perishable products as the consignment is transitioned to specified temperature controlled storage area)
02. Refrigerated staging area at 12°C (as above)
03. Temperature and humidity controlled storage room/s capable of operating between 0 to 14°C (allowing settings to be adjusted to meet requirements of products being handled)
04. Controlled atmosphere, temperature, humidity controlled storage capable of operating between 0 to 14°C
05. Air container build area fitted with pallet roller system to operate at 12°C
06. Temperature and humidity controlled Flight Storage Room fitted with pallet roller system set capable of operating at 0 to 14°C
07. Roll-on, roll off refrigerated dispatch dock suitable for air containers
08. Biosecurity inspection room.

Certain frozen products, including meat and dairy, may require additional facilities. Storage for such products may be required as low as -18°C. Freezer storage rooms would be separate from cold rooms.

The electricity consumption of cold storage facilities will vary depending on the type of facility (i.e. chilled temperature control requirement), but is calculated to require from 30 kWh/m^3/year to over 200 kWh/m^3/year. The efficiency is also impacted by facility design components including lighting technology, geographical climate, insulation and sealing mechanisms (e.g. automatic doors), among other factors. Both single and three phase power would be required to operate a chilled storage facility.

An additional requirement for the integrity of the cold chain in air freight is the available supply of both dry ice and wet ice. Perishable products may be shipped with different types of coolants such as dry ice, wet ice or gel packs. Insulating blankets may also be used to cover packaging or the entire ULD as appropriate to minimise impact of temperature variations through the supply chain. Where dry ice is a suitable coolant for the product being shipped (e.g. meat and aquaculture) care must be taken for both human and product safety. Dry ice is considered a hazardous material for air transport and requires special handling, labelling and documentation. As dry ice changes to carbon dioxide gas, it displaces oxygen. As such, it must not be placed in an airtight container where pressure would build up. Dangerous goods (class 9) labelling and markings must accompany any shipment with dry ice.

4.2.1 Cold chain consideratons (continued)

Perishable foods are generally not transported in temperature controlled air freight ULDs such as "Envirotainers" (temperature controlled air cargo cold chain transportation container) due to the cost of freight with such equipment. Temperature sensitive pharmaceuticals and healthcare products often utilise such equipment where the product value is significantly higher than food products. Where powered Envirotainers are utilised, the temperature control is achieved with rechargeable batteries that can be charged at standard AC-power connection points.

On board aircraft, temperatures vary depending on the type of aircraft, the location of each cargo compartment and the package location within each compartment, the length of flight, and the cruising altitude. For general reference, temperatures aboard most wide-body aircraft main cargo compartments vary between 18°C and 32°C. Packages positioned in the bulk department, next to the aircraft's outer structure, might be exposed to temperatures as low as -18°C during flight. Air pressures on aircraft may vary from as low as 8.3 psi at cruise altitude to as much as 14.7 psi on the ground (Fedex, 2019).

Temperature control within the cargo compartments will depend on the presence of live animals. For example, if domestic pets are transported on a passenger flight, the cargo compartment must be pressurised and held at a similar temperature to the passenger cabin, which may not be ideal for cargo depending on integrity of the cold chain. This would support the notion of exporting via dedicated freight aircraft to ensure that the cold chain requirements are met throughout transit.

4.2.2 Product packaging technology

Modified atmosphere packaging (MAP) is a technique where food is sealed in a package and the atmosphere inside the package is altered. This can be achieved either by applying a vacuum or by replacing normal air with a single gas type or a mixture of gases. MAP is useful as it slows the growth of microorganisms responsible for spoilage resulting in an increased shelf-life. In addition, the low oxygen environment can minimise the development of rancidity of products during storage. This packaging is being developed and trialled within several of the target product groups (for both domestic consumption as well export), including meat, horticulture products and seafood.

4.2.3 Security and compliance

Cargo terminal operators and cargo handlers (CTOs) working at terminals handling international cargo have obligations under the Customs Act 1901 to ensure the security of goods under customs control. These obligations strengthen the cargo supply chain against organised crime and criminal infiltration.

Commencing March 2019, the Department of Home Affairs introduced the Enhanced Air Cargo Examination (EACE) program, which requires that 100% of international air freight cargo is examined at a piece level regardless of destination. This examination is undertaken either at the premises of a Regulated Air Cargo Operator (RACA) or by a Known Consignor prior to delivery to a freight forwarder or CTO.

All perishable exports must comply with both Australian export rules and import requirements of the destination country. DAWR maintains a database to provide the "Manual of Importing Country Requirements" (MICoR) which also provides Australian export rules by product category.

4.2.4 Food assurance and Blockchain

The Australian food industry has tremendous opportunity, throughout the supply chain, to meet and exceed increasing consumer and regulatory expectations for quality and technical assurance. The necessity for enhanced food assurance is being driven by increased consumer demand, regulatory changes and the increasing complexity and globalisation of food supply chains. Blockchain technology provides assurance across the end to end supply chain. It allows supply chain participants to trace food products from suppliers to retail, and ultimately to consumers. In addition, the Internet of Things (IoT) can provide a platform for businesses to monitor, analyse and respond faster and more efficiently. The real-time probity allows supply chain participants to respond in a timely manner to address food assurance requirements throughout the value chain.

4.2.5 Personnel

The core roles required to facilitate the physical export of air freight cargo at a regional airport includes personnel at the CTO, Australian Boarder Force and the Department of Agriculture and Water Resources (DAWR).

CTO handlers

CTO cargo handlers include anyone involved with moving the goods in, out or within the cargo terminal; loading, unloading or storing of goods; and packing or unpacking the goods. Staffing will include people who physically handle the goods, as well as administration and management. The personnel engaged at the CTO are also responsible for ensuring final security clearance for each consignment prior to loading it onto the aircraft.

Australian Border Force (ABF)

The Department of Home Affairs is responsible for a wide range of border protection functions including the clearance and screening of passengers and crew entering and departing Australia, as well as regulation and clearance of the goods they bring with them. Such border protection activities are undertaken by ABF personnel.

ABF officers would not necessarily require a permanent presence at a regional airport in NSW for the purpose of air freight export clearance. The ABF takes a risk-management approach when assessing CTO's and cargo handlers' implementation of their obligations. As such, at a minimum, ABF offices will undertake audits and inspections of approved premises. ABF officers have powers to access CTO facilities at their discretion to ensure compliance with those obligations.

The requirement for ABF officers to be present at an airport is minimal where the only movement is outbound (export) freighter aircraft. If the aircraft involves passenger travel, the ABF presence increases to undertake screening and customs clearance activities for each individual passenger. If the aircraft movement involves import of goods to the airport, the ABF presence also increases further to undertake monitoring and clearance of those goods being imported.

Department of Agriculture and Water Resources (DAWR)

DAWR monitors the exports of agricultural products to assure trading partners that Australian produce exports meet their destination import requirements that are controlled by importing countries. For export of controlled goods, an Authorised Officer (AO) will be required to inspect the produce to provide clearance for export. The AO personnel required to undertake inspections at a point of export depends on the product being exported and the country it is being exported to.

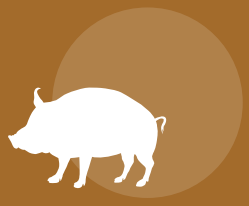
Authorised Officers are trained individuals who are authorised under the Export Control Act 1982 to perform specific export inspection functions in accordance with Australian export legislation, including issuing Phytosanitary certification and other export compliance approvals. AOs can be employed by DAWR or industry-employed individuals working on behalf of DAWR. When undertaking these export inspection functions, AOs are regarded as Australian Government officials. AOs may conduct a range of functions for a number of commodities, based on their training and assessment history.

It should also be noted that for some commodities, an importing country may place restrictions on who can undertake audits. For example, establishments that prepare or store meat for export to the USA may only be audited by an auditor employed by the department. Similarly the AO may not be an employee of the export registered establishment subject to the audit.

5. What supply chain issues should be considered for the high value export products?

The high value products identified can be categorised into four broader categories, made up of meat (beef, lamb and pork), dairy, summerfruit and aquaculture. To support air freight exports of these products airport related infrastructure is required, as is broader supply chain infrastructure. Supply chain characteristics were identified for each product category to map packaging, handling, temperature control and transportation attributes required for successful international delivery.

5.1 Meat products



Meat products within the priority product categories include beef, lamb and pork. Exportable products within this category are shipped either as whole carcasses or cuts of meat that are vacuum sealed and packaged in shipper cartons.

Where packaged meats are concerned, whilst air freight is predominantly utilised for chilled products, there is a market for some premium frozen meats to also be transported by air freight.

A feature of the market appeal for Australian meat is the regulatory and compliance requirements of the exported product, including bio security obligations, traceability and health controls. These same extensive controls may also be seen as onerous on the producers and exporters as a barrier to new market entrants.

Australian Pork Limited (APL) provided this assessment in their submission to the 2019 review of the export control rules, stating "satisfying Australia's domestic regulation, as set out in the Export Control (Meat and Meat Products) Orders 2005, requires establishment accreditation, approved arrangements, permits, certificates, inspectors, quality assurance systems, product traceability, official marks, regular audits, trade descriptions, chemical withholding periods, export slaughter intervals, and more. The tangle of compliance measures is difficult to unravel, particularly for small to medium enterprises." (Australian Pork, 2019).

Product Characteristics:

Shelf life from pack house

Beef cuts up to 20 weeks chilled (vacuum packed at 0°C), or up to eight months if frozen at -12°C. Beef carcasses up to 4 weeks at 0-2°C.

Lamb cuts up to 12 weeks chilled (vacuum packed at 0°C) or up to twelve months if frozen at -12°C. Lamb carcasses up to 4 weeks at 0-2°C.

Pork cuts up to 3 weeks chilled (vacuum packed at <5°C) or up to 6 months if frozen at -12°C. Pork carcasses up to 8 days at 0-2°C.

Destination market specific shelf life variations exist. For example:

- Restriction to maximum allowable shelf life that may be recorded on packaging
- Minimum period of shelf life to be available on arrival
- Maximum period between slaughter and arrival.

For high value, premium meat products, to cater for paddock to plate style requirements a 20 day life is considered the industry standard.

Other characteristics

Pork carcasses are predominantly shipped to Singapore, with the current supply chain delivering within 24 hours of slaughter.

Seasonality

Beef and lamb experience small seasonal reductions during winter, with higher availability during spring and summer.

Pork is more consistent due to intensive production systems.

Significant weather events (e.g. drought, flood) may result in variation to the stock available for slaughter.

Transport from Producer / Processor / Pack House to Export Facilitator:

Mode of domestic transport

Refrigerated road freight is predominant mode.

Temperature control

Chilled and frozen.

For chilled beef, maintaining a temperature close to -1°C is essential for an extended shelf-life. Even small increases in storage temperatures for extended periods are detrimental and significantly reduce meat quality and shelf-life.

Produce packaging

Whole carcasses may be wrapped with a stockinette.

Vacuum sealed chilled cuts packed in sturdy corrugated cardboard shipping cartons or polystyrene containers.

Cuts may be large wholesale sizes or retail ready portion packs.

Shipment presentation

Packed on domestic pallets for delivery to export facilitator. May be transported from pack house as discreet consignment prepared for immediate lodgement by freight forwarder at CTO, or may be a large shipment to freight forwarder who will break down into discrete consignments for separate lodgement (at direction of the consignor)

Export Facilitator Handling Processes:

Carcass

Generally loaded from delivery vehicle directly into ULD, coolant and insulation added then delivered to airport CTO.

Cartonised product

Delivered to freight forwarder on domestic pallets, moved to cool room at 0-4^{O} C until packed in required order quantities in/on ULD, coolant and insulation added then delivered to airport.

Air Freight Cold Chain Transit Requirements:

Coolant utilised

Carcasses – dry ice.

Vacuum packs – dry ice.

Care must be taken with dry ice to ensure it is not placed in contact with the meat to prevent freezer burn (with the temperature being minus 78°C).

Additional insulation

Thermal blanket wrap may be used to cover ULD or stacked cartons for insulation.

Further measures

Data loggers will often be used in consignment to track temperature during transit. Such records may be useful if temperature related compliance claims arise.

Freight Forwarder and Cargo Terminal Operational Requirements:

Storage requirements

Sufficient cool room space with variable / multiple temperature control. Use of cold dolleys for movement of ULDs, particularly during transhipment.

Storage restrictions

Meat is restricted for storage at approved export facilities for maximum of 72 hours.

Current Logistics Challenges Raised During Stakeholder Feedback Discussions:

Origin

Congestion and curfew at Sydney airport may require early delivery, or delivery at night to wait overnight for an early flight the next day. This adds significantly to the transit time.

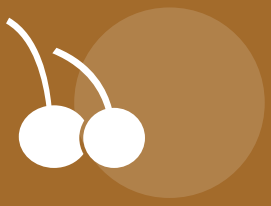
Transit

Maintaining temperature control while in transit, particularly when transhipping is required through hub ports.

Destination

Shipper has no control over handling at destination between arrival at international airport and delivery to customer. Concern that consignments are not always handled properly.

5.2 Summerfruit



Summerfruit products include apricots, cherries, nectarines, peaches and plums. Exportable products within this category are shipped in retail ready display packs or smaller retail units packed inside shipper cartons.

Trade protocols for many destinations require a phytosanitary certificate for the import of plants and plant products. This certification is provided after successful inspection by an Authorised Officer, usually at the location where the export consignment is prepared, or after fumigation is completed at an accredited facility. When applicable, phytosanitary certificates are issued for each individual consignment and provide details of any disinfestation and/or disinfection treatment undertaken to comply with both Australian export rules and destination import regulations.

Alongside, or instead of, fumigation trade protocols may require refrigeration of fresh produce as a form of pest management. Such cold treatment may be required for time periods as long as 16 days. Cold treatment may be done on the premises of the grower or pack house if facilities are in place, although also likely to be undertaken at third party facilities.

Product Characteristics:

Shelf life from pack house

Summerfruit should not be stored beyond its normal storage life of between one and six weeks, depending on variety, maturity and storage conditions.

Blueberries maximum shelf life is approximately 2 weeks, as long as appropriate cold chain conditions are maintained from immediate post-harvest through to consumption

Other characteristics

Existence of export protocols is essential first enabling step for export of fresh produce. Currently protocols are not available for blueberries produced in NSW for export to Japan or China.

Seasonality

Seasons vary by variety type within each product group, but may extend for the period below, depending on the growing region:

- Apricots: November to February
- Nectarines: November to April
- Peaches: November to April
- Plums: December to April
- Cherries: November to January
- Blueberries: June to February

Transport from Producer / Processor / Pack House to Export Facilitator:

Mode of domestic transport

Refrigerated road freight is predominant mode.

The transit time from farm to uplift at Sydney airport is currently 24-48 hours, however this may increase if export consignment is cross docked while in transit (see below).

Temperature control

Correct storing and handling is important in maintaining good quality Australian summer stonefruit. The ideal storage temperature is 0° to 2° Celsius. Fruit will ripen most effectively between 8° and 25° Celsius.

Under no circumstances should summer stonefruit be stored for any length of time within the range of 2° to 8° Celsius. At this temperature the fruit will cease to ripen naturally and may exhibit browning of the flesh and a loss of juice. Fruit stored above 25°C will ripen rapidly and become overripe within 48 hours.

Blueberries optimum temperature control is 3-6°C

Mode of domestic transport

Shipped in retail ready display packs or smaller prepack consumer units packed inside shipper cartons or expanded polystyrene boxes.

Shipment presentation

Packed loose in cartons or, for premium product, on display trays (in cartons) on domestic pallets for delivery to export facilitator. May be transported from pack house as discreet consignment prepared for immediate lodgement by freight forwarder at CTO, or may be a large shipment to freight forwarder who will break down into discrete consignments for separate lodgement (at direction of the consignor).

Export Facilitator Handling Processes:

Logistics in Sydney

Horticulture producers delivering to Sydney will likely transport produce for home consumption and export together. The transport provider will also likely collect freight from multiple pack houses on the route to Sydney. The Sydney Markets is a central distribution hub for such produce and some transport providers may unload the export consignments at this location, requiring the exporter's freight forwarder to arrange on forwarding to their facility near Sydney airport.

When cross docked in this manner, cold chain integrity may not be maintained while awaiting collection by the freight forwarder.

Cartonised product

Produce will be delivered to a freight forwarder on domestic pallets. It will be moved to a cool room and held at 0-4°C until packed in required shipment order quantities. The cartons will be placed on the air freight ULD/s, with suitable coolant added, then delivered to airport CTO.

Air Freight Cold Chain Transit Requirements:

Coolant utilised

Exporters may undertake varying approaches to temperature management depending on the product, destination and routing. Accordingly, if the produce is kept in a cold temperature environment (below 4°C) from harvest, through domestic transit to airport, there may not be any extra coolant used in the packaging. Using a freight forwarder with cold chain facilities at origin and destination and avoiding routes requiring transhipment may be considered sufficient temperature management for these products

Freight Forwarder and Cargo Terminal Operational Requirements:

Storage requirements

Sufficient cool room space with variable / multiple temperature control. Use of cold dolleys for movement of ULDs, particularly during transhipment.

Storage restrictions

No storage time restriction applies to horticultural products

Current Logistics Challenges Raised During Stakeholder Feedback Discussions:Operational Requirements:

Origin

Some transport providers (on behalf of producers) prefer not to deliver to the Sydney airport vicinity due to congestion and delays, in the interest of managing their fatigue hours for their return trip to the regional location.

Location and availability of fumigation facilities will impact the exporter's decision of where to export from and when. These facilities can become a restricting factor for export during peak season.

Transit

Some stone fruit produce may be suitable for sea freight, where the transit time to destination is reasonable short (e.g. up to 2 weeks to Asian locations) and producers will split their harvest across the freight modes, using air freight for early market access with additional product shipped via sea for continued supply.

5.3 Aquaculture

Aquaculture products include oysters, rock lobster and king prawns. Exportable products within this category may be shipped live, chilled or frozen cooked. Fresh aquaculture is particularly suitable for air freight given the short window of freshness.

Temperature abuse is the single greatest factor in loss of quality in fish and seafood products. As such a shipper will seek an airline that is experienced in both handling their product and is reliable in regards to meeting the planned schedule.

To address issues of corrosion damage to aircraft cargo compartments from spills of seafood cargo, Australian domestic airlines (during the 1980s) developed regulations to control packaging of seafood for air transport. These regulations are more stringent than the IATA code. Qantas freight applies these regulations for freight lodged by their customers. It is noted that other freight providers have similar documents available publicly (e.g. DHL and Fedex). The document is referred to by way of providing a guide for air freight packaging performance requirements, packing methods and a packaging approval system.

The packaging approval process requires that all packaging used to transport seafood by Qantas is tested against these regulations and granted an approval number. As at 2015 over 200 containers were approved by this system, offering a variety of packaging options for compliant air freight.

Product Characteristics:

Shelf life from harvest

Oysters: shelf life varies by species. Pacific oysters must be chilled below 5°C within 24 hours of being harvested and have a shelf life of up to 10 days. Sydney Rock Oysters will live in a cool environment at 10-15°C for 2 to 3 weeks. Once opened oysters stored between 0-5°C will last 2-3 days, but best consumed within 24 hours.

Rock Lobster: Live up to 3 days in refrigeration (up to 5°C). Cooked product may be stored up to 3 days in refrigeration or 3 months when frozen at -18°C

King Prawn: Prawns are highly perishable in their raw state (3 days in optimal conditions) and therefore are often frozen or boiled at sea when caught. Once frozen shelf life is up to 3 months at -18°C

Other characteristics

Oysters may only be exported from classified areas in accordance with AQIS export criteria for shellfish. In 2016 NSW had 23 export approved harvest areas with DAWR approval for export to most markets (excluding EU and USA).

Oysters, lobsters and prawns may also be transported live.

Seasonality

Oysters: Pacific oysters are available most of the year with peaks from April to September. Sydney Rock oysters also available most of the year, peak from September to April. Some other varieties are more accessible in the cooler months.

Rock Lobster: Available year round.

King Prawn: Available year round with peaks from February to June.

Transport from Harvester / Processor / Pack House to Export Facilitator:

Mode of domestic transport

Refrigerated road freight is predominant mode.

Temperature control

Oysters: 3 – 5°C, stored out of water, in refrigeration with 100% humidity but not frozen. May be stored on well drained ice. Live oysters should be transported in a refrigerated environment maintaining an air temperature of 10°C or less.

Live lobsters should be transported between 4 - 20°C to minimise stress.

Processed prawns and lobster may be frozen at -18°C or chilled at below 5°C.

Live seafood

Live lobsters: if transport to market will take more than 8 hours, lobsters should be conditioned by starving them prior to travel, reducing the temperature to slow their metabolism (depending on where caught) and reducing exposure to sunlight or bright light (as this increases their metabolism). Additionally claws will be pegged or banded shut to avoid damage.

Live prawns may be dry packed in sawdust, with ice gel packs for cooling.

Produce packaging

Packaging must be watertight, with a leak proof barrier (e.g. leak proof bag in leak proof box).

Packaging must be sturdy for stacking on pallets and in ULD's (e.g. expanded polystyrene boxes (EPS) or corrugated fibreboard that is polyethylene coated or wax impregnated – these are single use options with regard to air freight). Moulded plastic, laminated fibreglass and metal containers may also be used.

Containers for live product may require air access, however must also demonstrate being leak proof.

Inner bags must be puncture resistant and of sufficient size to be folded and taped closed. Air should be removed from sealed bags to minimise impact of pressure changes while in transit.

Absorbent material may be used between the inner bag and outer packaging.

Example approved packaging for the priority aquaculture products includes:

Oysters: A protective waxed fibreboard outer containing a tied plastic bag which contains three waxed fibreboard inner cartons.

Live lobster: High density polyethylene (HDPE) tub with clipped and plastic tied lid, noting that live shell fish requires ventilation during transit, air holes will be present near the top edge of the tub. Each lobster have a separate compartment to prevent fighting and therefore reduce oxygen consumption and physical damage.

Prawns: Outer cardboard carton, EPS lead proof inner container, with inner polyethylene bags containing (separately) ice and prawns.

Shipment presentation

Consignments will be delivered to the export facilitator in approved packaging, packed with coolant and appropriate labelling to indicate whether product is live, fresh or frozen.

Export Facilitator Handling Processes:

Chilled product

Generally loaded from delivery vehicle directly into ULD, extra coolant may be added, then delivered to airport CTO.

Frozen product

Delivered to freight forwarder on domestic pallets. Either loaded directly into ULD and transferred to CTO or moved via freezer room ideally at -18° C until packed in required order quantities in ULD, coolant added then delivered to airport.

Air Freight Cold Chain Transit Requirements:

Coolant utilised

Dry ice, wet ice, ice packs, gel packs may be used, depending on the type of approved packaging utilised.

Further measures

Data loggers will often be used in consignment to track temperature during transit. Such records may be useful if temperature related compliance claims arise.

Freight Forwarder and Cargo Terminal Operational Requirements:

Storage requirements

Sufficient freezer / cool room space with variable / multiple temperature control. Use of cold dolleys for movement of ULDs, particularly during transhipment.

Storage restrictions

No storage time restriction applies to aquaculture products.

Current Logistics Challenges Raised During Stakeholder Feedback Discussions::

Origin

Working with a reputable freight forwarder experienced in handling these products was considered essential, especially as product may be under their control for up to 36 hours during transit from harvest location. This related both to temperature management as well as export documentation compliance and efficient destination clearance processes.

Transit and Destination

The preference for direct services was expressed to avoid loss of temperature control through transhipment. Important to have an experienced and knowledgeable clearance agent at destination to avoid delays and errors with the import formalities required.

5.4 Dairy

Dairy includes predominantly fresh milk. Other dairy products including ice cream, yoghurt, and cheese may also be exported via air freight, however this is to a lesser extent than milk. Exported milk is packed in similar retail packs to those used for domestic consumption, with market specific labels.

Product Characteristics:

Shelf life from production

Fresh pasteurised milk: 10-14 days

Yoghurt: 4-6 weeks

Fresh cream: 14-18 days

Ice cream: 2-6 months

Other characteristics

During stakeholder interviews one company indicated the shelf life of their fresh milk is 21 days from production, with at least 17 days remaining on arrival in China.

Seasonality

Milk is not affected by seasonal variations

Demand may be impacted by destination seasonality, for example reduced demand during Chinese New Year when many businesses in the target market are closed.

Transport from Producer / Processor / Pack House to Export Facilitator:

Mode of domestic transport

Refrigerated road freight is predominant mode

Temperature control

Milk, yoghurt and cream should be kept between 0 - 4°C

Ice cream should be stored at -18°C or colder

Produce packaging

Milk is exported in retail packaging as used for domestic consumption, with destination specific labels applied and special bottle caps which utilise an induction seal that is tighter than the regular cap used on domestic milk bottles. Bottles are packed in shipping cartons (more sturdy corrugated cardboard is used for export compared to domestic requirement).

Shipment presentation

Packed on domestic pallets for delivery to export facilitator. May be transported from producer as discreet consignment prepared for immediate lodgement by freight forwarder at CTO, or may be a large shipment to freight forwarder who will break down into discrete consignments for separate lodgement (at direction of the consignor).

Export Facilitator Handling Processes:

Cartonised product

Pallets of milk are moved to cool room on receipt and subsequently packed into dispatch orders.

Optimal shipping for one stakeholder spoken to indicated that 1200 litres fits within an AKE load unit, with a preference of a minimum order quantity (and multiples) being a full AKE per customer. This approach enables efficient handling at destination.

Air Freight Cold Chain Transit Requirements:

Coolant utilised

Dry ice is packed in ULDs by the freight forwarder

Further measures

Temperature data loggers will often be used in consignment to track temperature during transit. Such records may be useful if temperature related compliance claims arise.

Freight Forwarder and Cargo Terminal Operational Requirements:

Storage requirements

Sufficient cool room space with variable / multiple temperature control. Use of cold dolleys for movement of ULDs, particularly during transhipment.

Storage restrictions

No storage time restriction applies to dairy products

Delivery lead time

Stakeholder feedback indicated milk is currently delivered to freight forwarders up to 12 hours prior to air freight uplift where the exporter is not a Known Consignor, hence requiring EACE inspection of the consignment. A shipment from a Known Consignor may be delivered to the freight forwarder four to six hours prior to uplift (for repacking and lodgement at the CTO).

Another freight forwarder indicated that consignments delivered to their facility at 5am may be prepared for flights departing from 7am, however such an arrangement depends on export pre clearance and agreement with the airline and their CTO.

Current Logistics Challenges Raised During Stakeholder Feedback Discussions

Origin

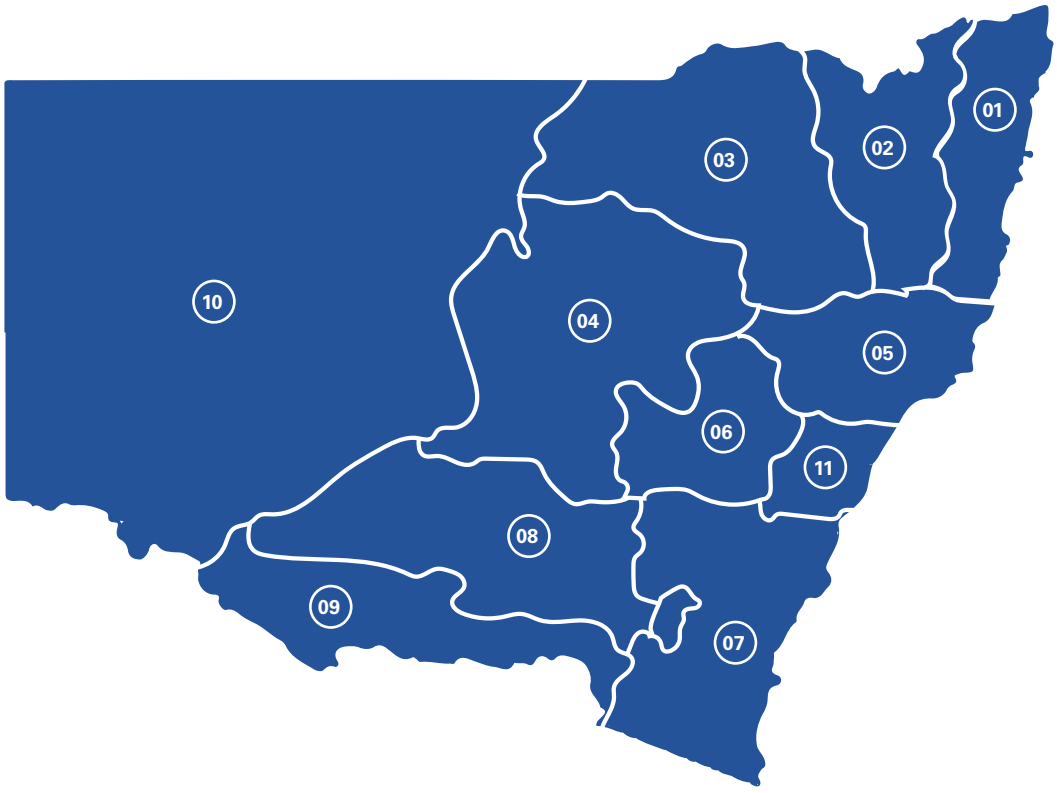
Stakeholder discussions indicated that it is not uncommon for consignments of fresh milk, booked and lodged for export on a specific flight, to be removed from the planned flight due to over loading. Rebooking has a flow on impact to availability at destination.

Destination

Although clearance at destination can be challenging, long term trusted relationships with both the overseas customers and the customs authorities improves the efficiency of clearance processes.

6. What is the capability and capacity of NSW regions to support air freight?

Each region in NSW is unique in terms of it ability and capacity to support the international air freight of perishable agricultural products. A preliminary analysis was undertaken to assess each region in NSW. Regions have been classified in accordance with the Government's Natural Resource Management (NRM) regional format.



01. North Coast
02. Northern Tablelands
03. North West
04. Central West
05. Hunter
06. Central Tablelands
07. South East
08. Riverina
09. Murray
10. Western
11. Greater Sydney

An analysis was undertaken to estimate the potential volumes of air freight produced in each region. While total production data is available for each region, data does not currently exist on the proportion of goods that are transported via air. Therefore, an initial estimate was developed to inform the pre-feasibility study.

Estimates of regional air freight production were based on the overall NSW proportion of total production that was air freighted. This is shown in the table below. It shows, for example, that of total beef produced in NSW only 0.41% was exported by air freight. These proportions have been applied against each region in a consistent manner. The estimations do not account for potential land use change and does not take into account the requirement for processing (e.g. abattoir) within a region. Further investigation of a detailed demand study in close consultation with the private sector is one of the potential focus areas for the next stage of the study.

Table 2: Air freight proportions of total production in NSW

Proportion of total NSW production that was exported via air freight in 2016 (based on volume)

Beef 0.41%	**Lamb** 1.78%	**Summerfruit** 49.69%
Aquaculture 6.34%	**Pork** 2.79%	**Dairy** 0.25%

Source: (ABS, 2019), KPMG analysis

Most of the NSW regional perishable agricultural products are currently transported to Sydney Airport via road. According to ABS, 98.6% of NSW's air freight products are exported via Sydney Airport in 2018. Products are handled at a freight forwarder and then at Sydney Airport before being loaded onto aircrafts for transport to export markets. Two alternative scenarios (operating models) were developed to improve transit times. The first scenario assumes that investment is made to upgrade a regional airport to handle direct freight services. The second scenario assumes that a 'hub and spoke' model is adopted. This assumes that product is loaded at a regional airport and then air transported to Sydney Airport or the future Western Sydney Airport before a direct flight onto international markets.

Note: a return leg is required for aircraft to return to Australia (i.e. the inbound leg). It is likely that under a direct regional freighter service, most aircraft would return to Australia via a major airport (such as Sydney) first. Aircraft would then be repositioned to the regional airport location.

98.6% of NSW's air freight products were exported via Sydney Airport in 2018

EXISTING OR CURRENT SUPPLY CHAIN

Farm

Processing or warehouse for packaging
Product is processed on site or at a dedicated facility and then road transported directly to the airport or to a third party handling facility.

Air cargo handling facility
Products are aggregated, sorted, packed and placed in appropriate temperature controlled storage. Due to the airport curfew some product is held overnight.Products are packed for loading on aircraft and road transported to the airport.

Road - Long distance road haulage from the region to Sydney

UPGRADE TO A REGIONAL AIRPORT TO CATER FOR DIRECT INTERNATIONAL SERVICES

Farm

Processing or warehouse for packaging
Product is processed on site or at a dedicated facility and then road transported directly to the air cargo facility (likely on premises at airport). Products are ready for loading on aircraft.

Air cargo handling facility (regional location)
Products are loaded onto dedicated freight aircraft or in the belly space of passenger aircraft and flown to an international location

Road - Short road haulage to regional airport

UPGRADE TO A REGIONAL AIRPORT TO CATER FOR HUB AND SPOKE SERVICES

Farm

Processing or warehouse for packaging
Product is processed on site or at a dedicated facility and then road transported directly to the airport cargo facility. Products are ready for loading on aircraft.

Air cargo facility at Airport (regional location)
Products are loaded onto dedicated freight aircraft and flown to Sydney or Western Sydney Airport.

Road - Short road haulage to regional airport

Air - Hub and spoke flight to major airport

Airport (Sydney)
Products are loaded onto dedicated freight aircraft or in the belly space of passenger aircraft and flown to an international location

Destination

Air - Air transport to international markets

Destination

Air - Air transport to international markets

Airport (Sydney or Western Sydney Airport)
Products are loaded onto dedicated freight aircraft or in the belly space of passenger aircraft and flown to an international location.

Destination

Air - Direct air transport to international markets

6.1 North Coast

The North Coast region has an approximate population of 503,000 (ABS, 2017) that supports a diverse economy that is strong in agribusiness, tourism, manufacturing, services and tech industries.

The agribusiness sector within the region supports a wide range of primary industries including forestry with certain areas being used for cropping and grazing and the rich land supporting fruit and vegetable crops (Local Land Services, 2019). There was 245,854 tonnes of dairy product produced in 2016, and 116,413 of beef produced in the same period which make up the majority of production in the region. Berries are also a product produced in the region that is high value. Norco Dairy is a large agribusiness commercial operator in the region that is currently exporting fresh milk to China. Costa Group is another large commercial operator in the region that operates in Corindi producing berries that are processed and sold both domestically and overseas.

To underpin potential future air freight export volumes, beef, dairy and horticulture, such as berries and summerfruit, would be the target high value export products from the region (based on historical and current production). Estimates of current production in the region and the assumed current product that can be air freighted internationally is shown in the table.

Top products

Estimated total production (tonnes) in 2016

Beef 116,413	**Lamb** 12	**Summerfruit** 255
Aquaculture 2,358	**Pork** 3,504	**Dairy** 245,854

Total 368,396

Estimated air freight (tonnes) in 2016*

Beef 477	**Lamb** 0	**Summerfruit** 127
Aquaculture 149	**Pork** 98	**Dairy** 615

Total 1,466

Source: (ABS, 2017), (ABARES, 2018) and KPMG analysis

*Note: Assumes product is produced in the region and then transported to a major airport to be exported. These are initial estimates only. While total production data is available for each region, data does not currently exist on the proportion of goods that are transported via air. Therefore, an initial estimate was developed to inform the pre-feasibility study.

Limitations
Further investigation of air freight production volumes in each region is required and feedback from stakeholders will be sought at the detailed feasibility stage.

For product originating from the North Coast region, the current likely options to export product via air freight would consist of either Sydney, Gold Coast, Toowoomba or Brisbane airports. Assuming product was exported via Sydney Airport it was estimated that the average transit time to reach an export hub such as Hong Kong would take around 34 hours. In contrast, if products can be exported via an airport in the region, the total transit time is estimated to reduce by around 17 hours. A hub and spoke operating model is also estimated to provide significant time savings of around 14 hours.

Source: KPMG analysis

Note: Road transit times where estimated based on travel times from a centroid location in the region and the amount of travel that would be rural and urban. Freight handling times at a staging facility or at the airport were informed by stakeholder consultation. Sydney Airport operates with a curfew which is expected to add time for staging and handling overnight. Air transit times where based on the distance travelled between the airport locations.

There are several airports within the North Coast region that could potentially be upgraded to support international air freight exports. Gold Coast /Tweed Heads Airport currently services regional, inter-state and international passenger routes with the belly cargo space of international wide bodied aircraft currently providing capacity for perishable agricultural products. Coffs Harbour and Lismore airports also service inter-state and regional passenger flights. An overview of the major airports within the region is provided in the table below.

Airports in the region	Total passenger movements 2018	Aircraft movements 2018	Longest runway length (m)
Gold Coast/Tweed Heads	6,541,135	41,451	2,492
Ballina/ Byron Gateway	526,774	4,586	1,900
Coffs Harbour	413,103	5,683	2,080
Port Macquarie	222,534	4,429	1,586
Lismore	14,275	1,643	1,647
Grafton	18,041	2,170	1,709
Kempsey	No RPT	No RPT	1,650

Source: (Bureau of Infrastructure, Transport and Regional Economics, 2019)

6.2 Northern Tablelands

The Northern Tablelands is the largest highland area in Australia with a variety of soils supporting predominantly producing beef, sheep and wool. Significant smaller industries include forestry, apples and stone fruit, potatoes, glasshouse tomatoes, dairy farms, alpacas and cool climate wineries (Local Land Services, 2019).

The region has a population of 70,534 (ABS, 2017), with major towns including Tenterfield, Glen Innes, Inverell, Guyra, Armidale, Uralla and Walcha. There was 212,229 tonnes of beef and 12,318 tonnes of lamb produced in 2016 that demonstrate the region's capability to produce high volume and high value product for export via air freight. Costa Group is an example of a large commercial operator in the region that operates in Guyra producing tomatoes in glasshouses.

To underpin potential future air freight export volumes, beef and lamb would be the target high value export products from the region (based on historical and current production). Protected horticulture in glasshouses could also produce high value products that could be exported via air freight. Estimates of current production in the region and the assumed current product that can be air freighted internationally is shown in the table.

Top products

Estimated total production (tonnes) in 2016

Beef 212,229	**Lamb** 12,318	**Summerfruit** 27
Aquaculture 206	**Pork** 3	**Dairy** 610

Total 225,393

Estimated air freight (tonnes) in 2016*

Beef 870	**Lamb** 219	**Summerfruit** 14
Aquaculture 13	**Pork** 0	**Dairy** 2

Total 1,118

Source: (ABS, 2017), (ABARES, 2018) and KPMG analysis

*Note: Estimated air freight tonnes is the estimated amount/proportion of total production that is air freighted from NSW, as opposed to being sold domestically. It indicates how much of the current production may be relevant to air freight, and the likely uplift that a regional air hub would create in exports.

Limitations
Further investigation of air freight production volumes in each region is required and feedback from stakeholders will be sought at the detailed feasibility stage.

For product originating from the Northern Tablelands region, the current likely options to export product via air freight would consist of either Sydney, Gold Coast, Toowoomba or Brisbane airports. Assuming product was exported via Sydney Airport it was estimated that the average transit time to reach an export hub such as Hong Kong would take around 33 hours. In contrast, if products can be exported via an airport in the region, the total transit time is estimated to reduce by around 15 hours. A hub and spoke operating model is also estimated to provide significant time savings of around 12 hours.

Source: KPMG analysis

Note: Road transit times where estimated based on travel times from a centroid location in the region and the amount of travel that would be rural and urban. Freight handling times at a staging facility or at the airport were informed by stakeholder consultation. Sydney Airport operates with a curfew which is expected to add time for staging and handling overnight. Air transit times where based on the distance travelled between the airport locations.

There are several airports within the Northern Tablelands region that could potentially be upgraded to support international air freight exports. Armidale Airport currently services regional and inter-state passengers. An overview of the major airports within the region is provided in the table below.

Airports in the region	Total passenger movements 2018	Aircraft movements 2018	Longest runway length (m)
Armidale	130,487	4,937	1,738
Inverell	No RPT	No RPT	2,114
Glen Innes	No RPT	No RPT	1,676

Source: (Bureau of Infrastructure, Transport and Regional Economics, 2019)

6.3 North West

The North West region is traditionally a wheat growing area, with other products produced including cotton, beef, lamb, pork cereal and oil seeds (Local Land Services, 2019).

The region has an area of approximately 82,000 square kilometres, a distance of over 440 kilometres and a population of 117,167 (ABS, 2017) of which approximately 7,500 people are employed directly in agricultural industries (Local Land Services, 2019). The construction of Keepit Dam in the 1960s has enabled areas of land suitable for irrigation to be developed and used for intensive cropping and the growth of a range of industries associated with more intensive land use, of farm input services and the transporting, processing and marketing of agricultural products (Local Land Services, 2019). There was 278,024 tonnes of beef and 39,639 tonnes of dairy produced in 2016 that demonstrate the region's capability to produce high volume and high value product for export via air freight. Thomas Foods International operate a food processing facility in Tamworth and supply beef and lamb to more than 85 countries globally.

To underpin potential future air freight export volumes, beef and lamb would be the target high value export products from the region (based on historical and current production). Estimates of current production in the region and the assumed current product that can be air freighted internationally is shown in the table.

Top products

Estimated total production (tonnes) in 2016

Beef 278,024	**Lamb** 7,331	**Summerfruit** 12
Aquaculture 62	**Pork** 1,765	**Dairy** 39,639

Total 326,833

Estimated air freight (tonnes) in 2016*

Beef 1,140	**Lamb** 130	**Summerfruit** 6
Aquaculture 4	**Pork** 49	**Dairy** 99

Total 1,428

Source: (ABS, 2017), (ABARES, 2018) and KPMG analysis

*Note: Estimated air freight tonnes is the estimated amount/proportion of total production that is air freighted from NSW, as opposed to being sold domestically. It indicates how much of the current production may be relevant to air freight, and the likely uplift that a regional air hub would create in exports.

Limitations
Further investigation of air freight production volumes in each region is required and feedback from stakeholders will be sought at the detailed feasibility stage.

For product originating from the North West region, the current likely options to export product via air freight would consist of either Sydney, Gold Coast, Toowoomba or Brisbane airports. Assuming product was exported via Sydney Airport it was estimated that the average transit time to reach an export hub such as Hong Kong would take around 33 hours. In contrast, if products can be exported via an airport in the region, the total transit time is estimated to reduce by around 15 hours. A hub and spoke operating model is also estimated to provide significant time savings of around 11 hours.

Source: KPMG analysis

Note: Road transit times where estimated based on travel times from a centroid location in the region and the amount of travel that would be rural and urban. Freight handling times at a staging facility or at the airport were informed by stakeholder consultation. Sydney Airport operates with a curfew which is expected to add time for staging and handling overnight. Air transit times where based on the distance travelled between the airport locations.

There are several airports within the North West region that could potentially be upgraded to support international air freight exports. Tamworth Airport currently services regional and inter-state passengers. Moree and Narrabri service flights from private operators. An overview of the major airports within the region in provided in the table below.

Airports in the region	Total passenger movements 2018	Aircraft movements 2018	Longest runway length (m)
Tamworth	191,853	4,978	2,200
Moree	36,404	1,718	1,613
Narrabri	7,816	871	1,524
Gunnedah	No RPT	No RPT	1,646
Collarenebri	No RPT	No RPT	1,218
Walgett	No RPT	No RPT	1,626
Lightning Ridge	No RPT	No RPT	1,406
Quirindi	No RPT	No RPT	1,770

Source: (Bureau of Infrastructure, Transport and Regional Economics, 2019)

6.4 Central West

The Central West region has a population of approximately 113,000 people and covers the central west slopes region around Grenfell, Forbes and Wellington to the western plains of Nyngan and Coonamble.

There is a wide range of rock, soil and land types and production of wool, cattle and wheat form the core of the region, with strong growth in horticulture, dairy farming and viticulture. Of the 7,113 people working in the agricultural industry, the beef, sheep and grain industry employed 88% of the agricultural workforce (Local Land Services, 2019). There is generally evenly spread winter and summer rainfall that supports productive cropping systems. The most significant land use is grazing (71%), followed by broad acre crops (17%). The region also has increasing areas of fruit and vegetable growing and viticulture. There was 215,230 tonnes of beef, 94,140 tonnes of lamb and 94,140 of dairy products produced in 2016 that demonstrate the region's capability to produce high volume and high value product for export via air freight. Fletcher International Exports is a large food processing operator in the region that is currently exporting lamb to multiple international destinations. In addition, Parkes was identified as the state's first Special Activation Precinct (SAP) site. The SAP is a dedicated area identified by the NSW Government to become a thriving business hub.

To underpin potential future air freight export volumes, beef, lamb and dairy would be the target high value export products from the region (based on historical and current production). Estimates of current production in the region and the assumed current product that can be air freighted internationally is shown in the table.

Top products

Estimated total production (tonnes) in 2016

Beef 215,230	**Lamb** 35,206	**Summerfruit** 133
Aquaculture 62	**Pork** 263	**Dairy** 94,140

Total 345,034

Estimated air freight (tonnes) in 2016*

Beef 882	**Lamb** 627	**Summerfruit** 66
Aquaculture 4	**Pork** 7	**Dairy** 235

Total 1,821

Source: (ABS, 2017), (ABARES, 2018) and KPMG analysis

*Note: Estimated air freight tonnes is the estimated amount/proportion of total production that is air freighted from NSW, as opposed to being sold domestically. It indicates how much of the current production may be relevant to air freight, and the likely uplift that a regional air hub would create in exports.

Limitations
Further investigation of air freight production volumes in each region is required and feedback from stakeholders will be sought at the detailed feasibility stage.

For product originating from the Central West region, the current likely options to export product via air freight would consist of either Sydney, Canberra, Gold Coast or Brisbane airports. Assuming product was exported via Sydney Airport it was estimated that the average transit time to reach an export hub such as Hong Kong would take around 32 hours. In contrast, if products can be exported via an airport in the region, the total transit time is estimated to reduce by around 16 hours. A hub and spoke operating model is also estimated to provide significant time savings of around 12 hours.

Source: KPMG analysis

Note: Road transit times where estimated based on travel times from a centroid location in the region and the amount of travel that would be rural and urban. Freight handling times at a staging facility or at the airport were informed by stakeholder consultation. Sydney Airport operates with a curfew which is expected to add time for staging and handling overnight. Air transit times where based on the distance travelled between the airport locations.

There are several airports within the Central West region that could potentially be upgraded to support international air freight exports. Dubbo and Parkes Airports currently service regional and inter-state passengers. An overview of the major airports within the region is provided in the table below.

Airports in the region	Total passenger movements 2018	Aircraft movements 2018	Longest runway length (m)
Dubbo	216,489	7,400	1,708
Parkes	30,247	1,801	1,684
Nyngan	No RPT	No RPT	1,643
Narromine	No RPT	No RPT	1,521
Coonamble	No RPT	No RPT	1,527
Warren	No RPT	No RPT	1,187
Coonabarabran	No RPT	No RPT	1,520
Forbes	No RPT	No RPT	1,228

Source: (Bureau of Infrastructure, Transport and Regional Economics, 2019)

6.5 Hunter

The Hunter region covers an area of 33,000 square kilometres east of the Great Dividing Range, from the dramatic sandstone escarpments and gorges of the Goulburn River, to the rich alluvial floodplains of the Hunter and Williams Rivers.

There are approximately 707,000 people living in the region supporting a wide range of industries, including agriculture, coal mining, power generation, forestry, fishing, tourism and recreation. The agricultural predominate agricultural activities include grazing of beef cattle, sheep, alpacas and goats, along with dairying, poultry production, dryland cropping, irrigated cropping, fodder production, and turf production on alluvial soils. The region is also well known for its thoroughbred horse industry and vineyards (Local Land Services, 2019). Grazing occurs throughout the Upper Hunter region and is the most frequent agricultural land use. . There was 155,948 tonnes of beef and 200,847 of dairy products produced in 2016 that demonstrate the region's capability to produce high volume and high value product for export via air freight.

To underpin potential future air freight export volumes, beef and dairy would be the target high value export products from the region (based on historical and current production). Estimates of current production in the region and the assumed current product that can be air freighted internationally is shown in the table.

Top products

Estimated total production (tonnes) in 2016

Beef 155,948	**Lamb** 759	**Summerfruit** 0
Aquaculture 5,152	**Pork** 1,614	**Dairy** 200,847

Total 364,320

Estimated air freight (tonnes) in 2016*

Beef 639	**Lamb** 14	**Summerfruit** 0
Aquaculture 327	**Pork** 45	**Dairy** 502

Total 1,527

Source: (ABS, 2017), (ABARES, 2018) and KPMG analysis

*Note: Estimated air freight tonnes is the estimated amount/proportion of total production that is air freighted from NSW, as opposed to being sold domestically. It indicates how much of the current production may be relevant to air freight, and the likely uplift that a regional air hub would create in exports.

Limitations
Further investigation of air freight production volumes in each region is required and feedback from stakeholders will be sought at the detailed feasibility stage.

For product originating from the Hunter region, the current likely options to export product via air freight would consist of either Sydney, Gold Coast or Brisbane airports. Assuming product was exported via Sydney Airport it was estimated that the average transit time to reach an export hub such as Hong Kong would take around 29 hours. In contrast, if products can be exported via an airport in the region, the total transit time is estimated to reduce by around 12 hours. A hub and spoke operating model is also estimated to provide significant time savings of around 10 hours.

Source: KPMG analysis

Note: Road transit times where estimated based on travel times from a centroid location in the region and the amount of travel that would be rural and urban. Freight handling times at a staging facility or at the airport were informed by stakeholder consultation. Sydney Airport operates with a curfew which is expected to add time for staging and handling overnight. Air transit times where based on the distance travelled between the airport locations.

There are several airports within the Hunter region that could potentially be upgraded to support international air freight exports. Newcastle Airport currently services regional, inter-state and international passenger routes. An overview of the major airports within the region is provided in the table below.

Airports in the region	Total passenger movements 2018	Aircraft movements 2018	Longest runway length (m)
Newcastle/Williamtown	1,265,004	14,109	2,438
Taree	11,263	1,317	1,504
Scone	No RPT	No RPT	1,404
Cessnock	No RPT	No RPT	1,097
Warnervale	No RPT	No RPT	1,200

Source: (Bureau of Infrastructure, Transport and Regional Economics, 2019)

6.6 Central Tablelands

The Central Tablelands region is located in central NSW and covers an area of approximately 31,365 square kilometres. It includes the major towns of Bathurst, Blayney, Cowra, Lithgow, Molong, Mudgee, Oberon and Orange.

The region has a population of approximately 165,000 people and approximately 7% of the region's population is employed in agriculture, fisheries and forestry. The region includes properties that make up 4.2% of NSW's annual value of agricultural production, includes almost 10% of NSW's agricultural business and contains 3.2% of NSW's agricultural land. A major area for grazing and broadacre crops, the region is home to horticulture, viticulture and fruit and vegetable produce (Local Land Services, 2019). There was 149,144 tonnes of beef, 15,748 tonnes of lamb and 32,755 of dairy products produced in 2016 that demonstrate the region's capability to produce high volume and high value product for export via air freight. Summerfruit is another high value perishable product that is produced in the Central Tablelands. BiteRiot! is an example cherry farm operating in Orange and exporting product to South-East Asian markets.

To underpin potential future air freight export volumes, beef, dairy, lamb and summerfruit would be the target high value export products from the region (based on historical and current production). Estimates of current production in the region and the assumed current product that can be air freighted internationally is shown in the table.

Top products

Estimated total production (tonnes) in 2016

Beef 149,144	**Lamb** 15,748	**Summerfruit** 1,638
Aquaculture 62	**Pork** 766	**Dairy** 32,755

Total 200,113

Estimated air freight (tonnes) in 2016*

Beef 611	**Lamb** 280	**Summerfruit** 814
Aquaculture 4	**Pork** 21	**Dairy** 82

Total 1,812

Source: (ABS, 2017), (ABARES, 2018) and KPMG analysis

*Note: Estimated air freight tonnes is the estimated amount/proportion of total production that is air freighted from NSW, as opposed to being sold domestically. It indicates how much of the current production may be relevant to air freight, and the likely uplift that a regional air hub would create in exports.

Limitations
Further investigation of air freight production volumes in each region is required and feedback from stakeholders will be sought at the detailed feasibility stage.

For product originating from the Central Tablelands region, the current likely options to export product via air freight would consist of either Sydney, Gold Coast or Brisbane airports. Assuming product was exported via Sydney Airport it was estimated that the average transit time to reach an export hub such as Hong Kong would take around 30 hours. In contrast, if products can be exported via an airport in the region, the total transit time is estimated to reduce by around 11 hours. A hub and spoke operating model is also estimated to provide significant time savings of around 8 hours.

Source: KPMG analysis

Note: Road transit times where estimated based on travel times from a centroid location in the region and the amount of travel that would be rural and urban. Freight handling times at a staging facility or at the airport were informed by stakeholder consultation. Sydney Airport operates with a curfew which is expected to add time for staging and handling overnight. Air transit times where based on the distance travelled between the airport locations.

There are several airports within the Central Tablelands region that could potentially be upgraded to support international air freight exports. Orange and Bathurst Airports currently service regional passenger routes and private interstate flights and Mudgee also services regional passengers into Sydney. An overview of the major airports within the region is provided in the table below.

Airports in the region	Total passenger movements 2018	Aircraft movements 2018	Longest runway length (m)
Orange	70,364	3,606	1,676
Bathurst	20,654	1,965	1,705
Mudgee	9,301	939	1,739
Cowra	No RPT	No RPT	1,630

Source: (Bureau of Infrastructure, Transport and Regional Economics, 2019)

6.7 South East

The South East region covers 55,600 kilometres of south-east NSW, from Stanwell Park in the north to the Victorian border in the south, and westward from Boorowa in the north to Thredbo in the South. The area covers 698 kilometres of coastline or 40% of the NSW coast (Local Land Services, 2019).

The region has a population of 645,000 (ABS, 2017) and supports diverse production including agriculture (sheep, beef, dairy and cropping), horticulture, aquaculture (Local Land Services, 2019). Over 5,000 people are employed in sheep, beef cattle and grain farming and a further 9,000 employed in agribusinesses, including food manufacturing (Invest Regional NSW, 2019).There was an estimated 344,246 tonnes of dairy products produced and 129,156 tonnes of beef produced in the region in 2016 which make up the majority of production in the region. Bega Cheese is an example of a large dairy producer that currently operates in Bega. Their products are exported to 40 countries around the world and distributed across Australia, where they are available in most supermarkets and general stores (Invest Regional NSW, 2019).

To underpin potential future air freight export volumes, beef, dairy and lamb and aquaculture would be the target high value export products from the region (based on historical and current production). Estimates of current production in the region and the assumed current product that can be air freighted internationally is shown in the table.

Top products

Estimated total production (tonnes) in 2016

Beef 129,156	**Lamb** 19,649	**Summerfruit** 71
Aquaculture 5,503	**Pork** 157	**Dairy** 344,246

Total 498,782

Estimated air freight (tonnes) in 2016*

Beef 530	**Lamb** 350	**Summerfruit** 35
Aquaculture 349	**Pork** 4	**Dairy** 861

Total 2,129

Source: (ABS, 2017), (ABARES, 2018) and KPMG analysis

*Note: Estimated air freight tonnes is the estimated amount/proportion of total production that is air freighted from NSW, as opposed to being sold domestically. It indicates how much of the current production may be relevant to air freight, and the likely uplift that a regional air hub would create in exports.

Limitations
Further investigation of air freight production volumes in each region is required and feedback from stakeholders will be sought at the detailed feasibility stage.

For product originating from the South East region, the current likely options to export product via air freight would consist of either Sydney, Canberra or Melbourne airports. Assuming product was exported via Sydney Airport it was estimated that the average transit time to reach an export hub such as Hong Kong would take around 30 hours. If products can be exported via an airport in the region, the total transit time is estimated to reduce by around 13 hours (noting that this currently occurs from Canberra Airport). Additionally, a hub and spoke operating model is estimated to provide time savings of around 10 hours.

Source: KPMG analysis

Note: Road transit times where estimated based on travel times from a centroid location in the region and the amount of travel that would be rural and urban. Freight handling times at a staging facility or at the airport were informed by stakeholder consultation. Sydney Airport operates with a curfew which is expected to add time for staging and handling overnight. Air transit times where based on the distance travelled between the airport locations.

There are several airports within the South East region that could support international air freight exports. Canberra Airport currently services regional, inter-state and international passenger routes with the belly cargo space of international wide bodied aircraft currently providing capacity for perishable agricultural products. Merimbula and Moruya also service regional flights. An overview of the major airports within the region is provided in the table below.

Airports in the region	Total passenger movements 2018	Aircraft movements 2018	Longest runway length (m)
Canberra (ACT)	3,179,211	40,010	3,283
Merimbula	59,300	2,917	1,602
Moruya	21,429	2,521	1,523
Snowy Mountains	7,816	731	2,120
Illawarra	No RPT	No RPT	1,819
Goulburn	No RPT	No RPT	1,283
Jindabyne	No RPT	No RPT	1,000

Source: (Bureau of Infrastructure, Transport and Regional Economics, 2019)

6.8 Riverina

The Riverina region covers 67,000 square kilometres of land and has a population of approximately 178,000 people. Land use in the region is mainly agricultural with dry land grazing and cereal based cropping accounting for over 80% of land use. Irrigation farming in the region covers over 5% of the area (Local Land Services, 2019).

Dry land grazing and cereal based cropping are key activities for the region as well as irrigation farming producing rice, grapes, citrus, vegetables and cotton. The region also has increasing areas of fruit and vegetable growing and viticulture. There was 172,397 tonnes of beef, 33,913 tonnes of lamb, 21,493 of dairy product and 3,654 tonnes of summerfruit produced in 2016 that demonstrate the region's diversity and capability to produce high volume and high value product for export via air freight. Aquna Sustainable Murray Cod is a commercial operator in the region that is currently exporting premium Murray cod to multiple international destinations. Within the region, Wagga Wagga was identified as the state's second SAP. The SAP precinct is investigating an area of around 4100 hectares, with 300 hectares already developed as part of the Bomen Business Park. Webster Limited is an example of a commercial operation that is producing quality walnuts in the Riverina region for both domestic supply and international export to Asia (Invest Regional NSW, 2019).

To underpin potential future air freight export volumes, beef, summerfruit and lamb would be the target high value export products from the region (based on historical and current production). Estimates of current production in the region and the assumed current product that can be air freighted internationally is shown in the table.

Top products

Estimated total production (tonnes) in 2016

Beef 172,397	**Lamb** 33,913	**Summerfruit** 3,654
Aquaculture 1,332	**Pork** 16,878	**Dairy** 21,493

Total 249,667

Estimated air freight (tonnes) in 2016*

Beef 707	**Lamb** 604	**Summerfruit** 1,816
Aquaculture 84	**Pork** 471	**Dairy** 54

Total 3,736

Source: (ABS, 2017), (ABARES, 2018) and KPMG analysis

*Note: Estimated air freight tonnes is the estimated amount/proportion of total production that is air freighted from NSW, as opposed to being sold domestically. It indicates how much of the current production may be relevant to air freight, and the likely uplift that a regional air hub would create in exports.

Limitations
Further investigation of air freight production volumes in each region is required and feedback from stakeholders will be sought at the detailed feasibility stage.

For product originating from the Riverina region, the current likely options to export product via air freight would consist of either Sydney, Canberra or Melbourne airports. Assuming product was exported via Sydney Airport it was estimated that the average transit time to reach an export hub such as Hong Kong would take around 31 hours. In contrast, if products can be exported via an airport in the region, the total transit time is estimated to reduce by around 12 hours. A hub and spoke operating model is also estimated to provide significant time savings of around 9 hours.

Source: KPMG analysis

Note: Road transit times where estimated based on travel times from a centroid location in the region and the amount of travel that would be rural and urban. Freight handling times at a staging facility or at the airport were informed by stakeholder consultation. Sydney Airport operates with a curfew which is expected to add time for staging and handling overnight. Air transit times where based on the distance travelled between the airport locations.

There are several airports within the Riverina region that could potentially be upgraded to support international air freight exports. Wagga Wagga Airport and Griffith currently services regional and inter-state passengers. An overview of the major airports within the region is provided in the table below.

Airports in the region	Total passenger movements 2018	Aircraft movements 2018	Longest runway length (m)
Wagga Wagga	224,499	7,039	1,768
Griffith	68,819	3,780	1,503
Narrandera	13,053	2,810	1,616
Hay	No RPT	No RPT	1,463
Young	No RPT	No RPT	1,220
West Wyalong	No RPT	No RPT	1,585
Cootamundra	No RPT	No RPT	1,427
Tumut	No RPT	No RPT	1,060
Temora	No RPT	No RPT	1,967

Source: (Bureau of Infrastructure, Transport and Regional Economics, 2019)

6.9 Murray

The Murray region spans more than 40,000 square kilometres across a range of environments, from the steep alpine slopes in the east to the vast native grasslands and riverine floodplains in the west. The region has a population of approximately 108,000, and approximately one-third of the residents are directly involved in agriculture.

Land and water resources within the Murray catchment support diverse agricultural enterprises, including cropping, grazing and horticulture. And the key agricultural activities include cereal production, especially rice, dairy, fruit, vegetable and wool production (Local Land Services, 2019). There was 137,522 tonnes of beef, 42,751tonnes of pork, 143,062 of dairy product and 16,686 tonnes of summerfruit produced in 2016 that demonstrate the region's diversity and capability to produce high volume and high value product for export via air freight.

To underpin potential future air freight export volumes, beef, summerfruit and lamb would be the target high value export products from the region (based on historical and current production). Estimates of current production in the region and the assumed current product that can be air freighted internationally is shown in the table.

Top products

Estimated total production (tonnes) in 2016

Beef 137,522	**Lamb** 16,686	**Summerfruit** 588
Aquaculture 62	**Pork** 42,751	**Dairy** 143,062

Total 340,671

Estimated air freight (tonnes) in 2016*

Beef 564	**Lamb** 297	**Summerfruit** 292
Aquaculture 4	**Pork** 1,193	**Dairy** 358

Total 2,708

Source: (ABS, 2017), (ABARES, 2018) and KPMG analysis

*Note: Estimated air freight tonnes is the estimated amount/proportion of total production that is air freighted from NSW, as opposed to being sold domestically. It indicates how much of the current production may be relevant to air freight, and the likely uplift that a regional air hub would create in exports.

Limitations
Further investigation of air freight production volumes in each region is required and feedback from stakeholders will be sought at the detailed feasibility stage.

For product originating from the Murray region, the current likely options to export product via air freight would consist of either Sydney, Melbourne or Canberra airports. Assuming product was exported via Sydney Airport it was estimated that the average transit time to reach an export hub such as Hong Kong would take around 34 hours. In contrast, if products can be exported via an airport in the region, the total transit time is estimated to reduce by around 16 hours. A hub and spoke operating model is also estimated to provide significant time savings of around 13 hours.

Source: KPMG analysis

Note: Road transit times where estimated based on travel times from a centroid location in the region and the amount of travel that would be rural and urban. Freight handling times at a staging facility or at the airport were informed by stakeholder consultation. Sydney Airport operates with a curfew which is expected to add time for staging and handling overnight. Air transit times where based on the distance travelled between the airport locations.

There are several airports within the Murray region that could potentially be upgraded to support international air freight exports. Albury Airport currently services regional and inter-state passengers. An overview of the major airports within the region is provided in the table below.

Airports in the region	Total passenger movements 2018	Aircraft movements 2018	Longest runway length (m)
Albury	264,583	7,743	1,900
Deniliquin	No RPT	No RPT	1,219
Corowa	No RPT	No RPT	1,827

Source: (Bureau of Infrastructure, Transport and Regional Economics, 2019)

6.10 Western

The Western region is the largest in NSW, covering 314,500 square kilometres or 40% of the state. It is larger than Victoria and Tasmania combined. Despite its size, it is the least densely populated region, with a population of approximately 40,000 people.

Grazing (sheep, cattle, goats), dryland agriculture (cereals in the southern Mallee), irrigated agriculture (cotton, horticulture and viticulture), mining, tourism and nature conservation are the main land uses within the Western region. Key agricultural activities in the region are wool growing, cotton and grains. There is also increasing goat and sheep meat production. There was 59,192 tonnes of beef and 24,125 tonnes of lamb produced in 2016 that demonstrate the region's capability to produce high volume and high value product for export via air freight (Local Land Services, 2019).

To underpin potential future air freight export volumes, beef and lamb would be the target high value export products from the region (based on historical and current production). Estimates of current production in the region and the assumed current product that can be air freighted internationally is shown in the table.

Top products

Estimated total production (tonnes) in 2016

Beef 59,192	**Lamb** 24,125	**Summerfruit** 0
Aquaculture 62	**Pork** 27	**Dairy** 0

Total 83,406

Estimated air freight (tonnes) in 2016*

Beef 243	**Lamb** 429	**Summerfruit** 0
Aquaculture 4	**Pork** 1	**Dairy** 0

Total 677

Source: (ABS, 2017), (ABARES, 2018) and KPMG analysis

*Note: Estimated air freight tonnes is the estimated amount/proportion of total production that is air freighted from NSW, as opposed to being sold domestically. It indicates how much of the current production may be relevant to air freight, and the likely uplift that a regional air hub would create in exports.

Limitations
Further investigation of air freight production volumes in each region is required and feedback from stakeholders will be sought at the detailed feasibility stage.

For product originating from the Western region, the current likely options to export product via air freight would consist of either Sydney, Adelaide, Melbourne or Brisbane airports. Assuming product was exported via Sydney Airport it was estimated that the average transit time to reach an export hub such as Hong Kong would take around 38 hours. In contrast, if products can be exported via an airport in the region, the total transit time is estimated to reduce by around 15 hours. A hub and spoke operating model is also estimated to provide significant time savings of around 12 hours.

Source: KPMG analysis

Note: Road transit times where estimated based on travel times from a centroid location in the region and the amount of travel that would be rural and urban. Freight handling times at a staging facility or at the airport were informed by stakeholder consultation. Sydney Airport operates with a curfew which is expected to add time for staging and handling overnight. Air transit times where based on the distance travelled between the airport locations.

There are several airports within the Western region that could potentially be upgraded to support international air freight exports. Broken Hill currently services regional and inter-state passengers. An overview of the major airports within the region is provided in the table below.

Airports in the region	Total passenger movements 2018	Aircraft movements 2018	Longest runway length (m)
Broken Hill	66,539	3,418	2,515
Bourke	No RPT	No RPT	1,830
Cobar	No RPT	No RPT	1,696
Brewarrina	No RPT	No RPT	1,386
Balranald	No RPT	No RPT	1,185
Tibooburra	No RPT	No RPT	976

Source: (Bureau of Infrastructure, Transport and Regional Economics, 2019)

6.11 Overview of Western Sydney Airport and its support for the regions

Western Sydney Airport (WSA) is a transformational infrastructure project that is set to generate significant economic activity, provide local employment opportunities for people in the Western Sydney region, and meet Sydney's growing aviation needs. Thousands of jobs and opportunities for local businesses will be created, not just once the WSA is operational, but throughout its design, planning and construction over the next five to ten years (Department of Infrastructure, Transport, Cities and Regional Development, 2019).

The WSA itself is due for completion in 2026/27, however within five years of the first runway being opened it will support almost 28,000 direct and indirect jobs, not just in aviation but also in other complementary industries.

Consolidation point for multiple regional areas

At present, there are low volumes of export air freight generated from regional airports to Sydney because the cargo capacity of aircraft operating regional air services is very limited and few products are of high enough value to sustain the air freight cost irrespective of back loading issues. WSA has the potential to generate new opportunities to increase the capacity of regional areas to connect into export markets by acting as a consolidation point.

Additionally, it is not just the air freight capacity itself that will be increased, but the proximity of the consolidation point is geographically favourable compared to the current air freight export location at KSA. The access of freighted goods (by road) will also be supported by the planned construction of the Outer Sydney Orbital (OSO) motorway will also provide 'spokes' to the WSA. The OSO will better connect the North Western and South Western production regions with the Aerotropolis (the broader WSA and its nine precincts) and facilitate effective and efficient freight access to the WSA. This ensures that trucking perishable products to the airport is done expeditiously, and delivers higher quality goods to the end-consumer.

Perishable agricultural supply

Within the Aerotropolis, the NSW Government has planned nine precincts that will support activity beneficial to the operation of the WSA itself and the broader region. One of these precincts is a food and agribusiness 'Intensive Integrated Production Hub' (IIPH) that will create an in situ protected food production system (e.g. greenhouse and hydroponic), co-located with processing, value-adding (e.g. pre-prepared foods and ready-made meals and snacks) and packing facilities that are quarantine approved and customs pre-cleared for air export. The IIPH's production systems alone will not yield large volumes of produce though; supplemented produce from Regional NSW will support the Hub's operations and ability to produced value-added foodstuffs. Overall, the IIPH has the ability to consolidated and prepared food for export to international destinations through the WSA 24/7 and within 36 hours of being harvested.

Landing and curfew

The 24 hour operations will allow WSA to cater for passenger and air freight arrival around-the-clock. This creates significantly more landing timeslots and may facilitate larger aircrafts when compared to Kingsford Smith Airport.

7. Summary of key findings and potential next steps

The key findings from the pre-feasibility study include the following:

— Five export markets (China, Japan, South Korea, Indonesia and United Arab Emirates) and two export hubs (Hong Kong and Singapore) were identified as potential priority export markets for regional perishable agricultural products.

— Of these markets, six perishable agricultural products (beef, lamb, summerfruit, aquaculture, pork and dairy) were identified as the highest value air freight exports for NSW.

— The total air freighted production volume within each region of NSW (as defined by the NRM boundaries) for the six priority products was estimated and is expected to provide an initial baseline level of demand for air freight exports.

— Significant transit time savings could be achieved either via a direct international freight service or via a hub and spoke model for regional air freight products.

— To enable air freight services from a regional location, investment may be required to upgrade existing airports to cater for a dedicated freighter aircraft. Investment in cold chain supply chain and dedicated cargo facilities is also required. Furthermore future investment attraction strategies in pre and post farm gate capability should also be considered to support targeted growth that could deliver critical mass through regional airports.

— Apart from Sydney Airport, existing major airports that may facilitate regional air freight include Canberra Airport and Gold Coast Airport. Western Sydney Airport could also provide direct freighter services or as a hub and spoke for air freight transported from regional NSW.

— The complexity of regional supply chains and lack of accurate regional export production data drives the need for further detailed investigation to identify options to improve air freight options in regional NSW.

As an initial assessment of perishable air freight in regional NSW, the study found that investment in improving regional air freight supply chains may be feasible, and further investigation into the supply chain will be needed to determine what infrastructure or policy options, including trade facilitation, would promote the best trade outcome to enhance growth of these markets.

The next stage of the study should focus on in-depth analysis of market demand and the supply chain, industry engagement and an economic, commercial and financial evaluation of the opportunity to ensure that the investment will be made to the area that would produce the best results for NSW farmers and producers.

Additional findings/limitations	Potential focus areas for the next stage
Demand for regional air freight infrastructure	
The study considered the current production of six key perishable air freight products in NSW and projected future production based on demand from the key export markets. The 'step' change or new and generated demand that could be realised from investment in regional air freight supply chains has not been investigated. Also, the demand estimates used in this study are based on pre-farm gate primary production statistics and do not consider the access or proximity of potential airport locations to existing processors (e.g. abattoirs), aggregators and/or finished goods manufacturers. Consideration will also need to be given to the location of new aggregation sites.	A detailed demand study, in close consultation with the private sector should be undertaken to forecast future demand. In particular, confirming with the private sector the stimulatory effect of new regional airport infrastructure on businesses/producer decision making. Further investigation is required to review and prioritise potential anchor producers and processors that could generate sufficient volume to justify regional airport investments. This should consider aggregation of product to determine whether there is 'critical mass'.
Other potential demand	
The study has focused on the six key perishable products identified as priorities for NSW. This however should not exclude the potential for other perishable products to be exported. Likewise, there will also be opportunities for other non-perishable products which may help with commercial viability of a regional air freight supply chain.	Consideration of other demand should be investigated further. Two way trade opportunities, i.e. imports should also be considered.
Seasonality of demand and impact on viability	
The export estimates used in this study have been assessed on an annual basis and do not consider the impact that natural seasonality of production could have on a regular international freight operation.	Further work is required to understand if fluctuations in supply volumes on a monthly basis would have a detrimental impact on potential air freight operations in a region. Noting that this could somewhat be mitigated through the supply from protected cropping intensive horticulture operations.
Commercial viability along the supply chain for all participants	
One barrier to be overcome for both exporters and freight providers is that any alternative to the current supply chain would have to be financially attractive to motivate businesses to consider a change. From the consignor's perspective, disrupting a supply chain that is working for one that is new, is a challenging hurdle, but to do so at a higher cost is an insurmountable obstacle.	The commercial operations of the airport and other supply chain related facilities (e.g. cold-chain management, wastage mitigation, worldwide best practice and innovation opportunities) requires further investigation to determine the preferred operating model that would allow all participants within the market to benefit from improved regional air freight connectivity.

Additional findings/limitations	Potential focus areas for the next stage
Vertically integrated supply chain	
The study has not investigated the possibility of a vertically integrated air freight supply chain that would, for example, be developed for the sole purposes of air freighting a single product into a single export market.	As part of the next stage, discussions should be held with private sector parties to understand the appetite for this type of arrangement including the operating, commercial and ownership model.
Direct flights or hub and spoke	
The study identified two different air freight operating scenarios including direct export freight services or a hub and spoke operation to either Sydney Airport or the new Western Sydney Airport.	The study should continue to investigate these opportunities and look at staging and ramp up options. It should also identify alternative models for further assessment. Likewise, the continued role of Sydney Airport (and/or the potential role of Western Sydney Airport) should be considered in terms of its capacity and flexibility to service multiple international markets when compared to a regional airport. Further, the assessment should also determine the utilisation factor of international passenger plane belly space to determine whether capacity constraints exist.
Capital costs for airside infrastructure	
The pre-feasibility study has not estimated the capital costs required to upgrade regional airports to cater for air freight services.	Further detailed infrastructure and engineering assessments of the current condition of the airport infrastructure will be required. Also, concept level drawings will be required to provide a bill of quantities to inform a detailed capital cost estimate that accords with the NSW Treasury business case guidelines.
Detailed economic appraisal	
A detailed cost-benefit analysis will be required to determine the wider benefits to the economy from investment in regional air freight supply chains. A cost-benefit analysis can help determine the preferred region for investment.	A detailed cost-benefit analysis should be undertaken to determine the economic viability of regional air freight. Investment options should pass the benefit-cost ratio (BCR) hurdle.
Catchment areas	
The estimated production volumes for each region presented in the study do not necessarily constitute the potential catchment area for a specific airport. The catchment area is expected to be made up of demand from multiple regions (i.e. adjoining regions).	Detailed assessment of potential catchment areas for potential airports.

Additional findings/limitations	Potential focus areas for the next stage
Financial and commercial assessment	
The pre-feasibility study has not investigated the financial and commercial viability on investment in a regional air freight supply chain.	A financial and commercial model should be developed in the next stage.
Trade policies	
The study highlighted existing trade agreements (e.g. FTA's) that are in place between Australia and its trading partners. The focus of the study however was on the infrastructure and supply chain issues. It will be equally important to understand any other barriers to trade that may exist between Australia and potential markets and where government can play a role in facilitating trade.	The role of government in supporting and facilitating the export of perishable products should be further identified and assessed (outside of infrastructure investment).
Non infrastructure solutions	
While infrastructure investment will play a crucial role in supporting additional air freight exports, there are other levers that could be used by the government. For example, the reduction of the curfew at Sydney Airport may allow additional flights to international markets that could provide additional capacity for freight. Also, changes to the movement cap at Sydney Airport may allow additional regional flights to operate under a hub and spoke model.	Consideration of other non-infrastructure solutions to support regional air freight
Market access and flexibility	
Several exporters and freight forwarders reiterated the need for frequent direct freight delivery services to their overseas markets, with a variety of destinations available. Exporters using air freight tend to export smaller volumes to multiple destinations to spread their market penetration and avoid overloading a discrete market with excess volume in a single consignment (which may result in wastage or discounts).	Further investigation is required to review potential producers and processors and understand intentional export flows.

8. Reference list

ABARES. (2018). Agricultural Commoditiy Statistics 2018.

ABS. (2017). Natural Resoure Management Region Production (references 71210DO002_201617 and 75030DO002_201617).

ABS. (2019). International Merchandise Trade: Customised Report (exports of all 5 digit SITC codes).

ABS. (2019). International Trade in Goods and Services (Table 5368, 36a).

AMPC. (2019). Impact of extended shelft life of chilled beef into overseas markets. Retrieved from https://www.ampc.com.au/2018/02/Impact-of-extended-shelf-life-of-chilled-beef-into-overseas-markets

Australian Civil Aviation Safety Authority. (2019). Manual of Standards Part 139.

Australian Pork. (2019). Export Taskforce Regulation.

Australian Pork Limited. (2019). Market data and insights.

Boeing. (2019). Freighters. Retrieved from https://www.boeing.com/resources/boeingdotcom/company/about_bca/startup/pdf/freighters/747-400f.pdf

Bureau of Infrastructure, Transport and Regional Economics. (2019). Airport traffic data. Retrieved from https://www.bitre.gov.au/publications/ongoing/airport_traffic_data.aspx

Central Intelligence Agency. (2019). The World Factbook. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/ch.html

Dairy Australia. (2019). International Market Briefs.

Dairy Safe Victoria. (2019). Shelf life of dairy products.

DFAT. (2019). Australia's Free Trade Agreements. Retrieved from https://dfat.gov.au/trade/agreements/Pages/trade-agreements.aspx

DPI. (2019). NSW Oyster Industry Sustainable Aquaculture Strategy.

Everblu Research. (2018). Seafood Industry Report.

Fedex. (2019). Packaging Perishable Shipments. Retrieved from https://www.fedex.com/content/dam/fedex/us-united-states/services/Perishables_fxcom.pdf

Food Standards. (2019). A guide to the Australian primary production and processing standard of seafood.

Horticulture Innovation Australia. (2017/18). Australia Horticulure Handbook.

International Trade Administration. (2019). Cold Chain Systems Country Rankings. Retrieved from https://www.export.gov/article?id=Cold-Chain-Systems-Country-Rankings

International Trade Center. (2019). Export Potential Map. Retrieved from http://exportpotential.intracen.org/#/exporters/geo-map?toMarker=j&market=344

Invest Regional NSW. (2019). NSW Government. Retrieved from https://www.investregional.nsw.gov.au/

Local Land Services. (2019). NSW Government. Retrieved from https://www.lls.nsw.gov.au/

Meat & Livestock Austraia. (2019). Market Data and Insights. Retrieved from https://www.mla.com.au/prices-markets/overseas-markets/market-data-and-insights/

Prime Safe. (2019). Shelf life and labelling requirements for meat products. Retrieved from https://www.primesafe.vic.gov.au/standards-and-guidelines/primenotes/shelf-life-and-labelling-requirements-for-meat-products/

Qantas. (2019). Seasfood Air Transport Regulations.

World Bank. (2019). Open Data. Retrieved from https://data.worldbank.org/indicator/SP.POP.TOTL

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