



**Australian Government**

**Department of the Environment and Energy**

# The Australian Food Cold Chain: Identifying Issues & Implementing Improvements

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# Presentation Overview

## Context

- National Strategy
- Status & challenges
- This study

## Food and the Cold Chain

- Australia's food production
- Size and make up of the cold chain
- The cold chain's characteristics and performance

## Food Waste

- Underlying situation
- Losses – size, scale and costs
- Improvements that can be made

# What is food loss and waste, and what are their consequences?

- **Food Loss** refers to food that gets spilled, spoiled or otherwise lost, or incurs reduction of quality and value during its process in the food supply chain before it can be eaten
- **Food waste** refers to food that completes the food supply chain but still doesn't get consumed because it is discarded, whether or not after it is left to spoil or expire. (UN Environment)

## Implications of Food Loss and Waste include

- Hunger
- Higher costs to consumers
- Greenhouse gas emissions
- Water wastage
- Land clearing and more

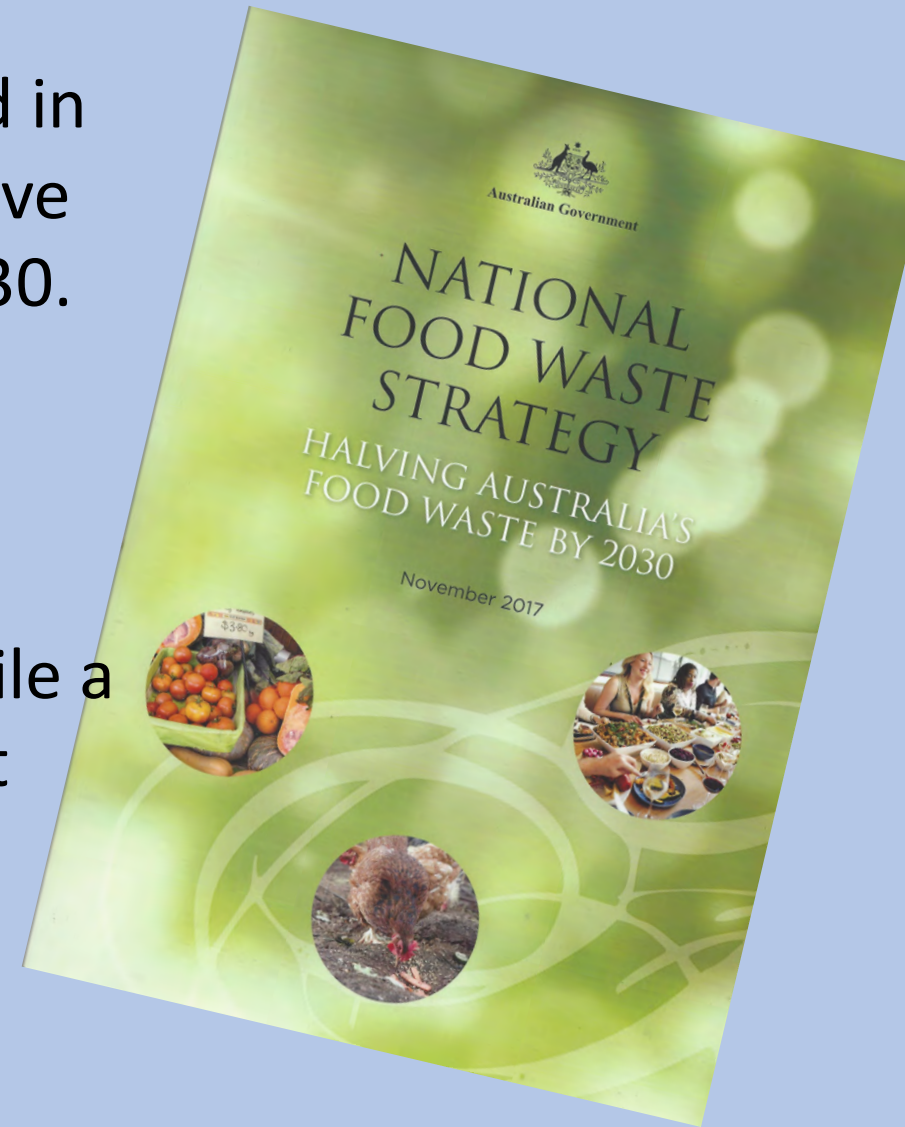


REFRIGERANTS  
AUSTRALIA



# Australia's National Food Waste Strategy

- Australia's *National Food Waste Strategy* – launched in late 2017 - provides a framework to support collective action towards halving Australia's food waste by 2030.
- The strategy contributes toward global action on reducing food waste by aligning with Sustainable Development Goal 12.
- An Implementation Plan is being developed and while a baseline study has been done, the lack of consistent comprehensive data has been identified as the key challenge.



# This Study

- Joint Government/industry effort – Rome MOP and the FAO building were great prompts!
- Based on data and approach prepared for assessment of refrigerants and RAC equipment
- First study of the scale food loss in the cold food chain in Australia, with a focus on identifying solutions

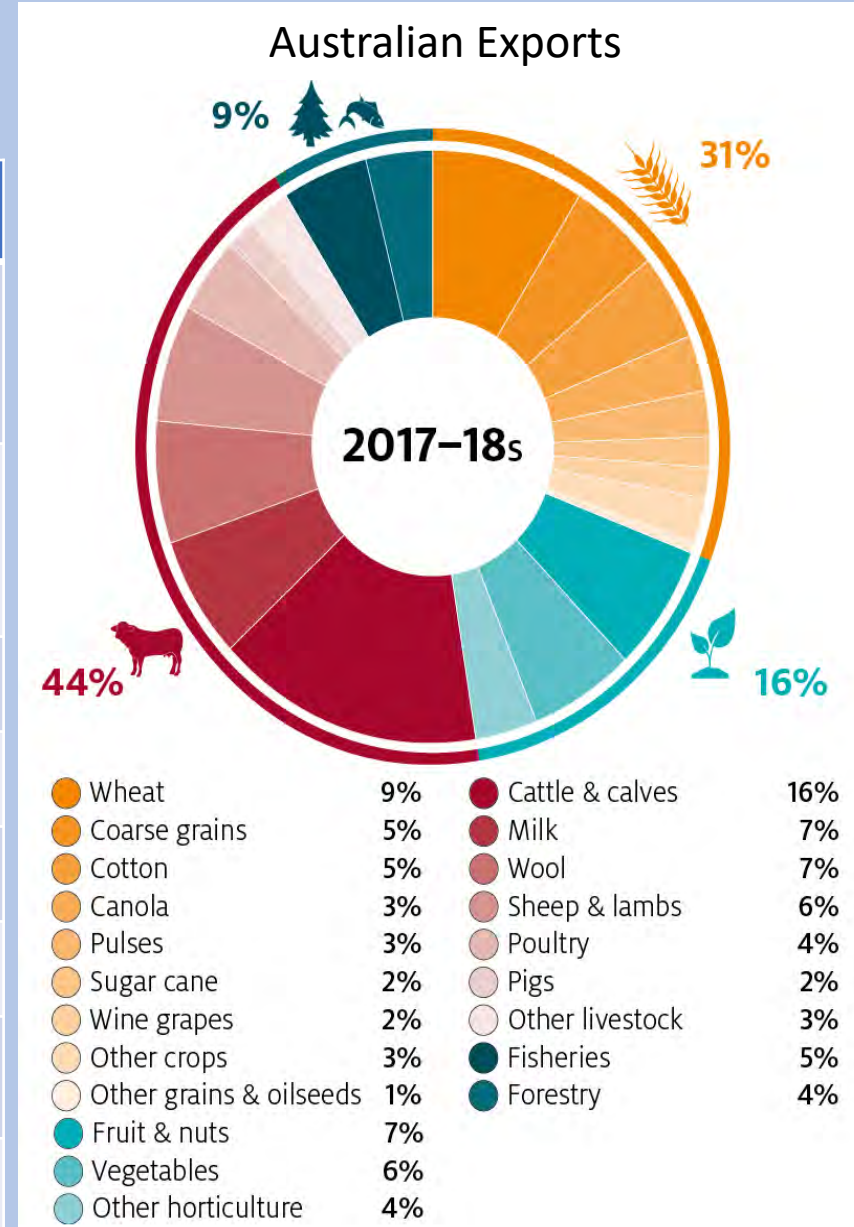


# Australia's food production and cold food chain – some basic facts

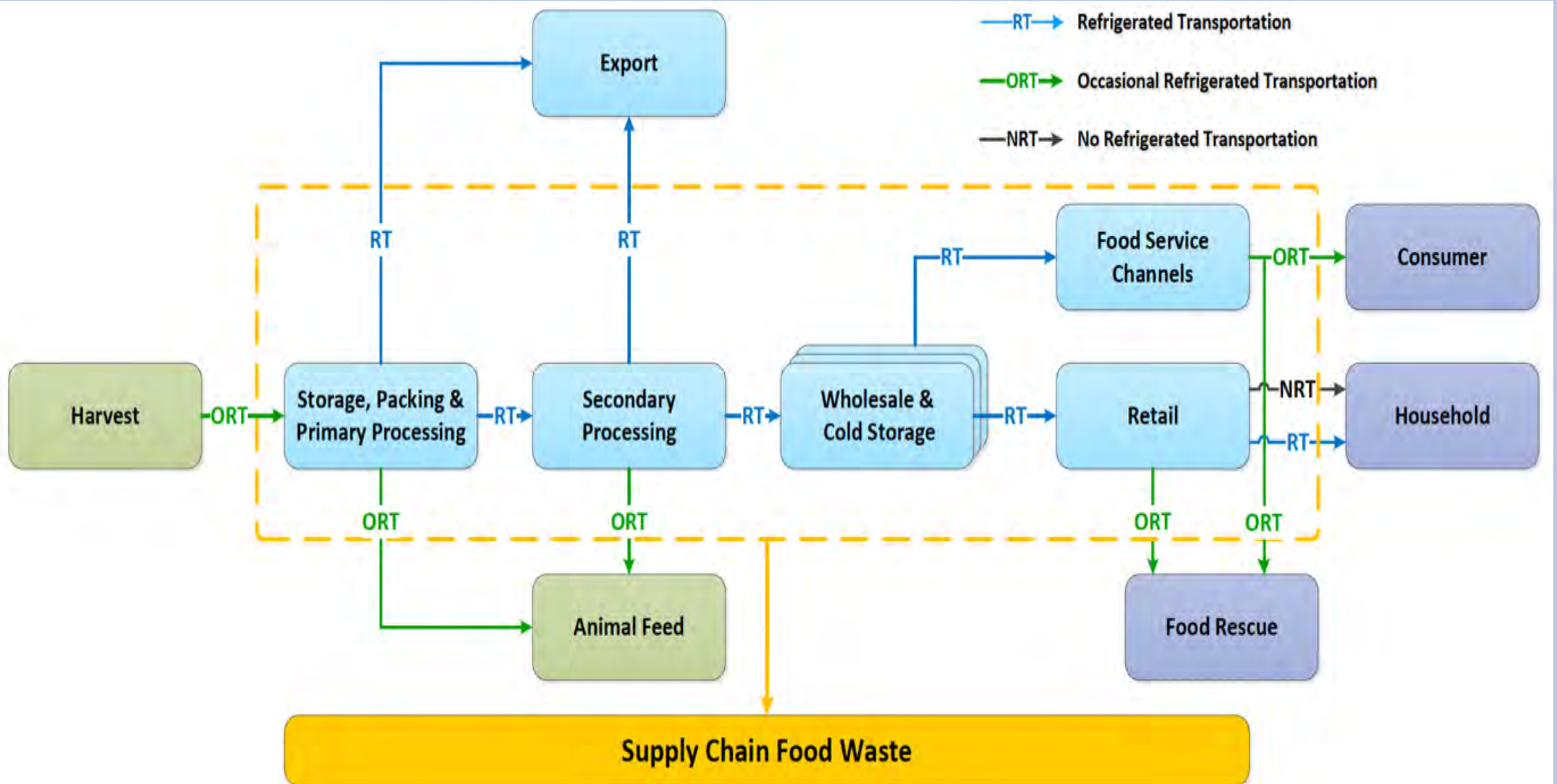
# Australia's food production & exports

## Food reliant on refrigeration

	Production volumes	Production values	Export volumes	Export values
	(Million tonnes)	(\$ Billion)	(Million tonnes)	(\$ Billion)
<b>Fruit</b>	4.575	\$7.030	0.541	\$1.878
<b>Vegetables</b>	3.695	\$4.346	0.206	\$0.255
<b>Meat</b>	4.583	\$19.819	2.167	\$11.440
<b>Seafood</b>	0.237	\$2.903	0.052	\$1.433
<b>Dairy &amp; eggs</b>	10.264	\$8.898	0.843	\$3.438
<b>Totals</b>	23.354	\$42.996	3.809	\$18.445



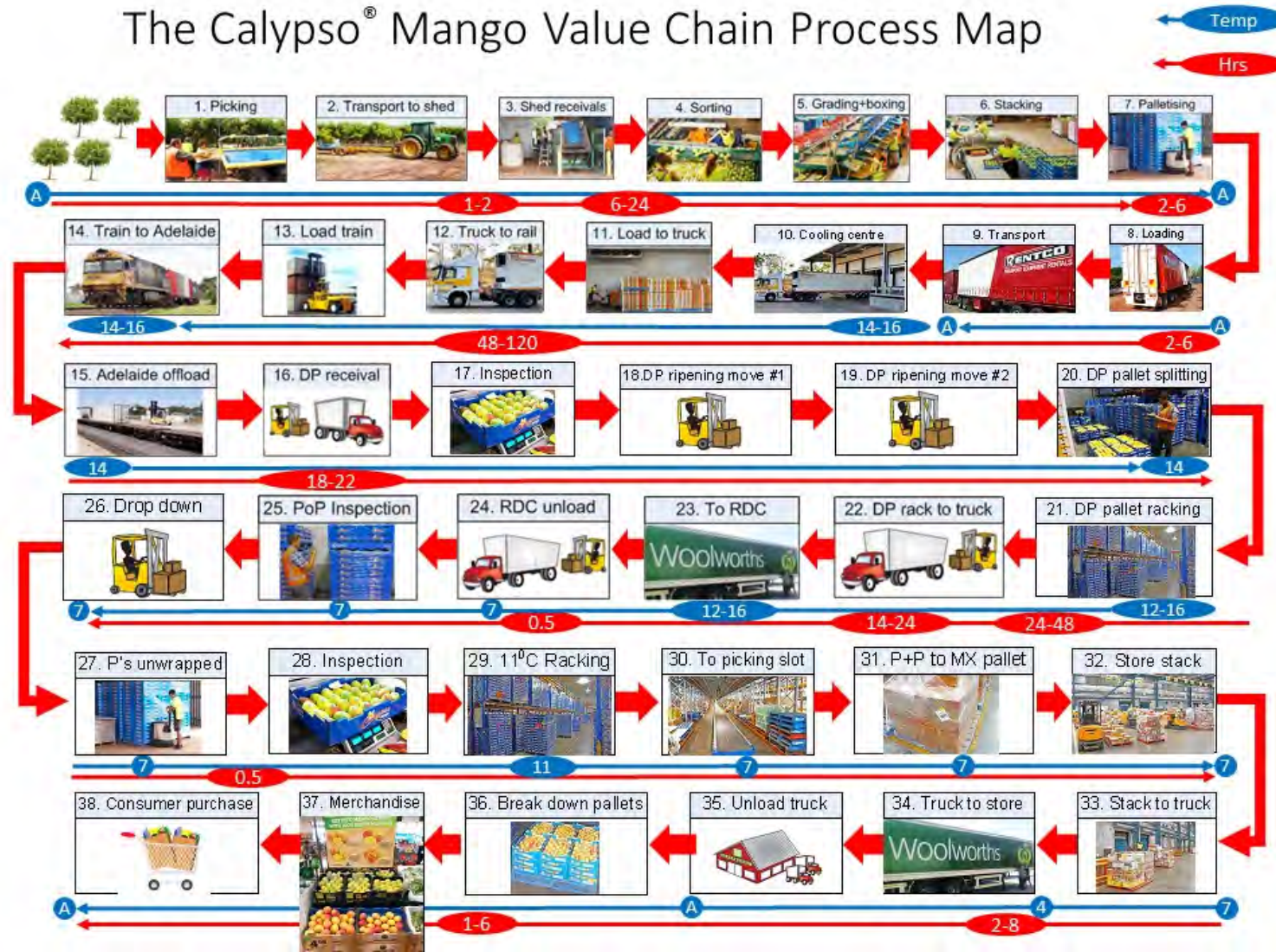
# Simplified description of Australia's food cold chain





# A detailed example of the food cold chain: mangoes

The Calypso<sup>®</sup> Mango Value Chain Process Map



## Greenhouse Gas Emissions – implications of Australia's food cold chain

- Emissions (direct and indirect) from the cold food chain = more than 3.5% of Australia's annual emissions
- BUT, emissions from food waste in the cold food chain is larger!
- Emissions from the cold food chain (including energy, refrigerant and food waste emissions) total about the same as the emissions from all of Australia's cars.





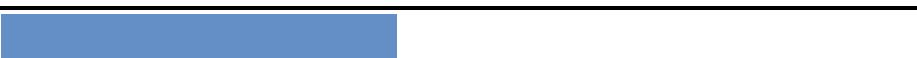

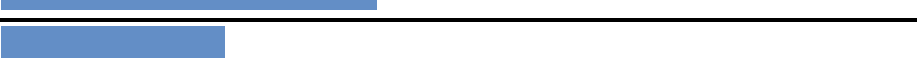

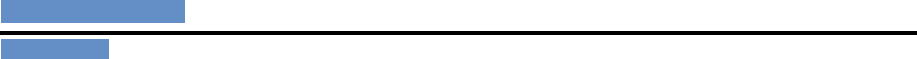
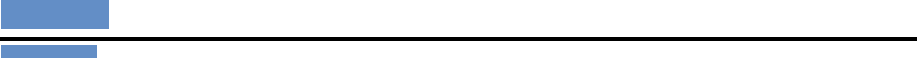




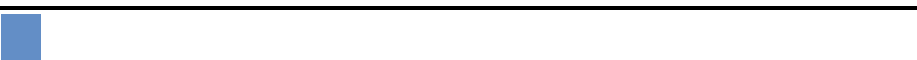
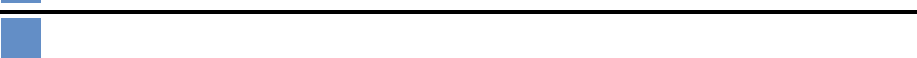
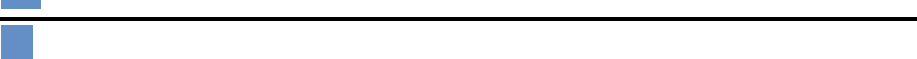
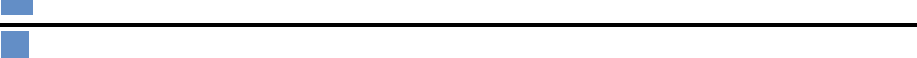
# Australia's food waste – the significance of the cold food chain

## Headline figures – Food Waste from Australia's cold chain

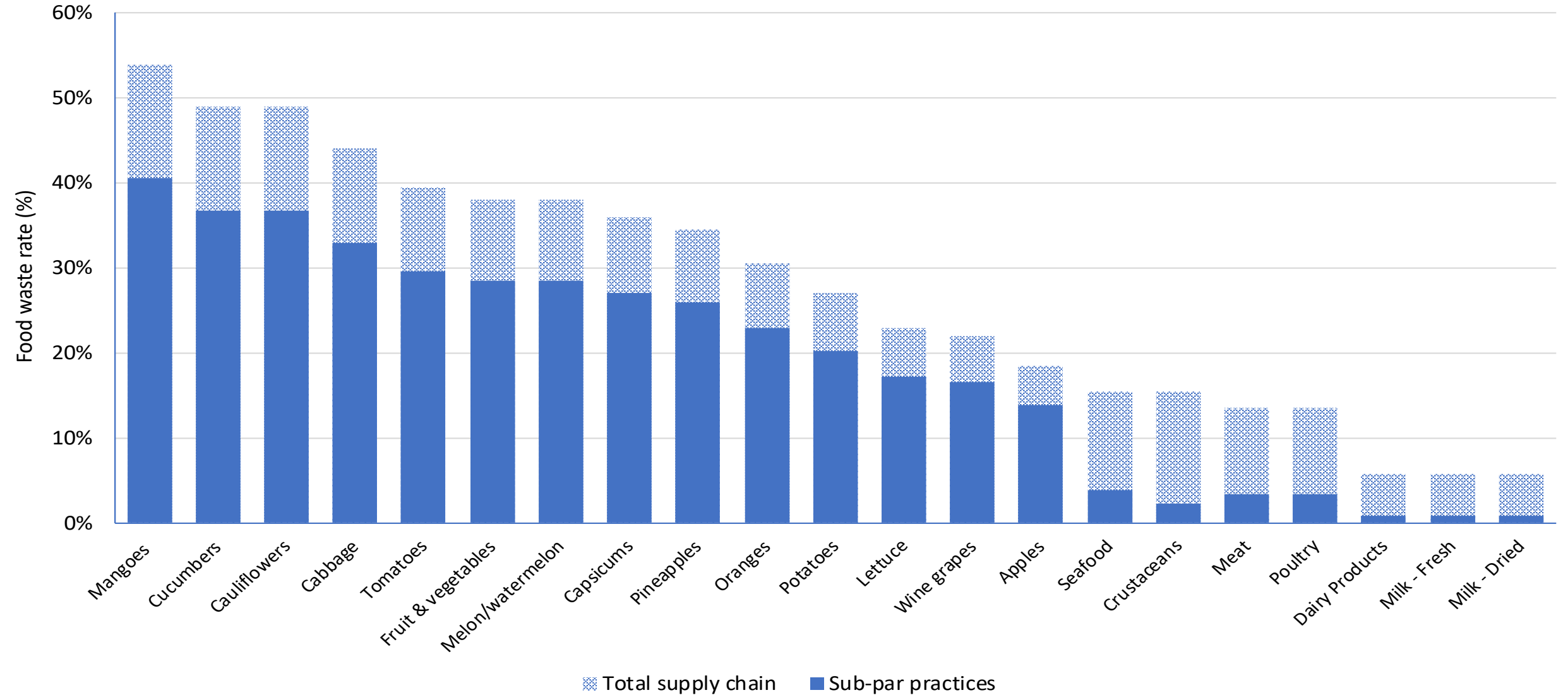
- Warning!! Estimates are preliminary & conservative.
- Total value (farm gate prices) of food waste at least AUD \$3.8 billion which comprised of:
  - 25% (1,930,000 tonnes) of annual fruit and vegetable production worth \$3.0 billion
  - 3.5% of annual production of meat (155,000 tonnes) and seafood (8,500 tonnes) worth \$670 million and \$90 million respectively; and,
  - 1% (90,000 tonnes) of dairy products valued at \$70 million.
- Estimates of losses in the food cold chain do not take into account impacts of sub-par conditions that reduce product shelf life in the hands of consumers.



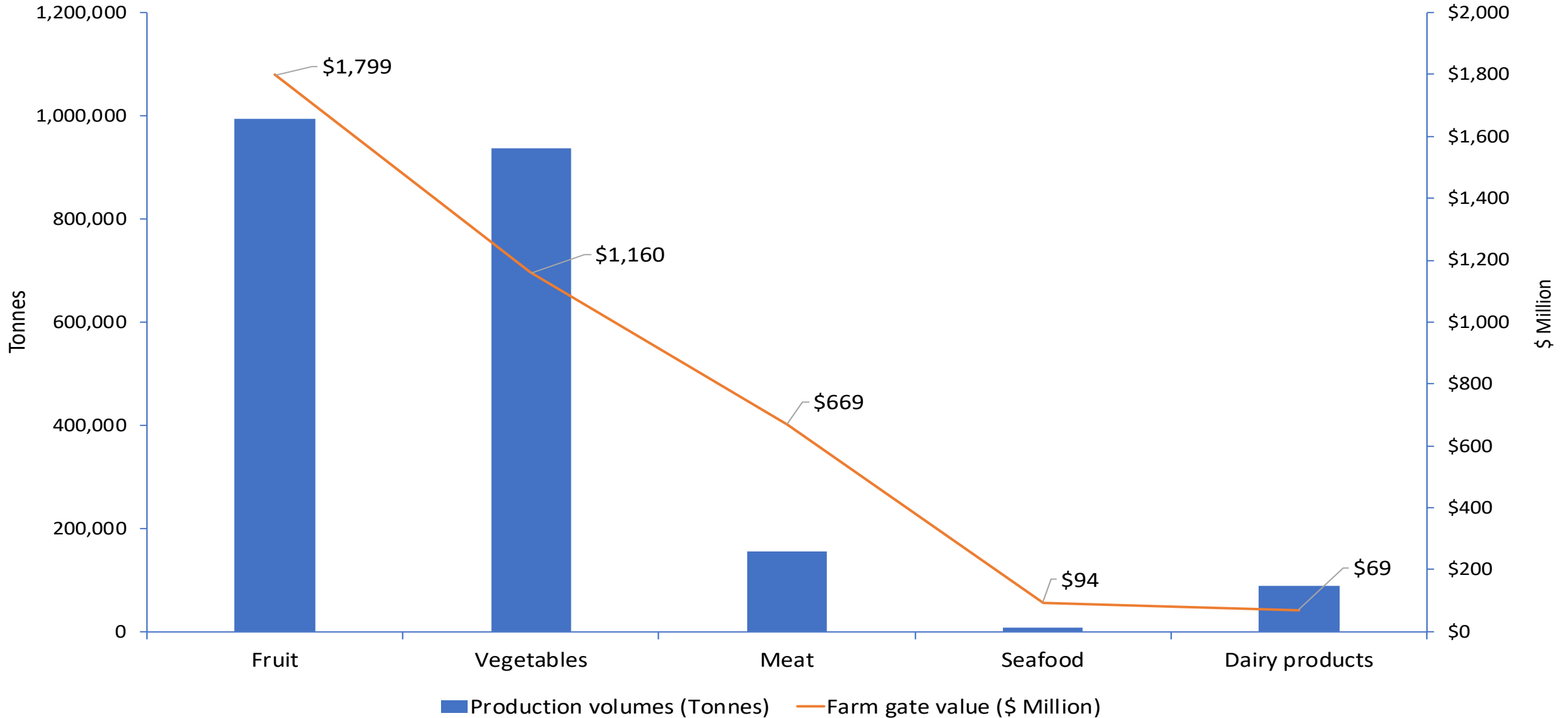
# Food is a perishable carbon intensive product

Food type	Comparative scale of emission intensity based on kg CO <sub>2</sub> e/kg of food waste type		
Beef	Very High	>15	
Meat (Average)	Very High		
Pork	High	>10 and ≤15	
Cheese	High		
Poultry	Medium	>5 and ≤10	
Dairy Product (Average)	Medium		
Yoghurt	Low	>2 and ≤5	
Seafood	Low		
Milk	Low		
Banana	Low		
Grape	Low		
Fruit & Vegetable (Average)	Very Low	≤2	
Apple	Very Low		
Carrot	Very Low		
Tomato	Very Low		
Lettuce	Very Low		

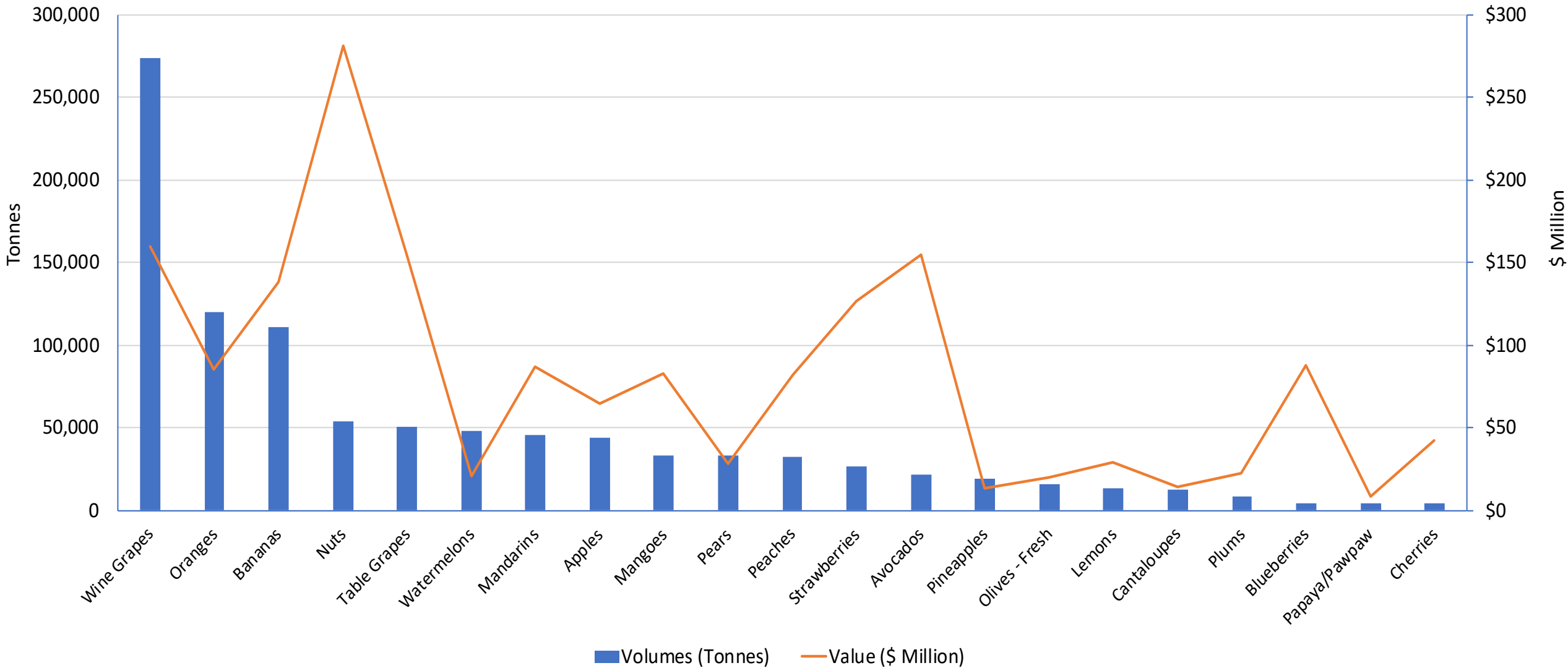
# Rates of food loss from the cold food chain



# Food Waste from the Cold Chain: values & amounts

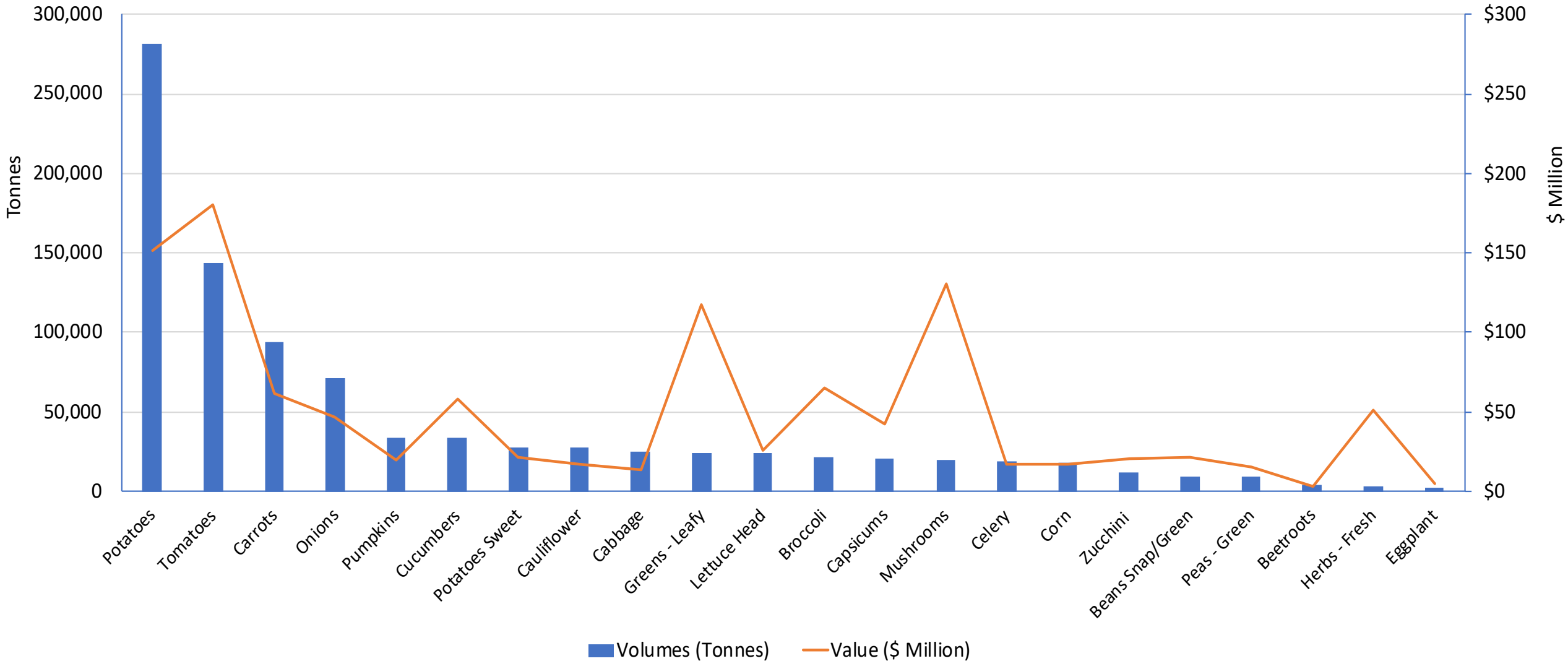


# Fruit waste volumes and values





# Vegetable waste volumes and values



Australia's food waste – how can it be improved?

## Where do losses happen in the cold chain?

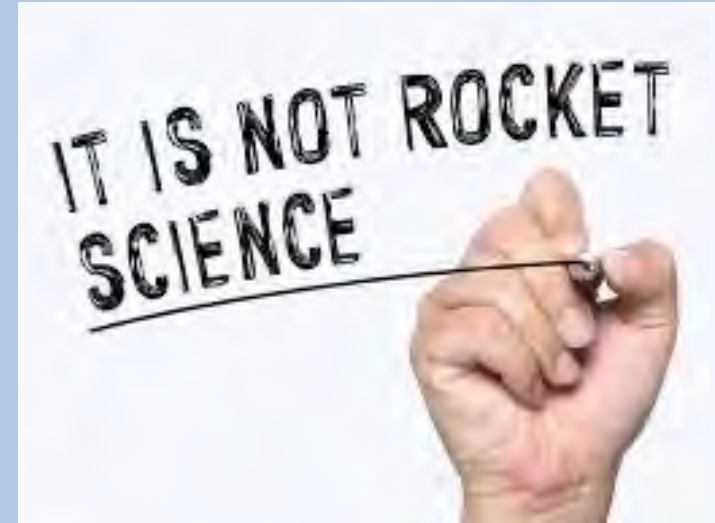
Finding: The greatest likelihood for perishable food to suffer damage is during transportation and handling between mobile and stationary refrigeration points

Focus on this area first!

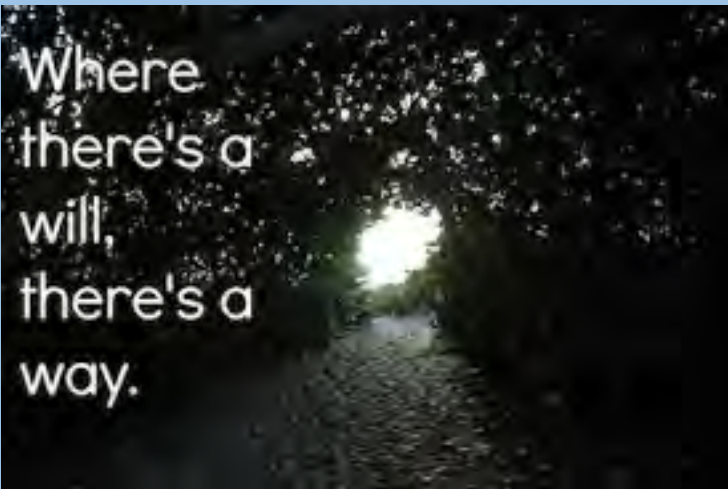


## How can the cold chain can be improved?

- Better handling of food – simply following good, common-sense practice
- Tracking food and sharing data throughout the cold chain.
- Real time monitoring of food conditions, such as temperature, humidity and location
- Improved operation and expansion of the cold food chain



These are all inexpensive options that mostly require behaviour change and little capital investment!



# Conclusion

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- The cold food chain is large, complex and important.
- At least in Australia, the food cold chain is not performing near its capacity
- Reducing food waste will reduce hunger, greenhouse gas emissions & other environmental pressures
- There exists the capacity to make improvements in the cold food chain cheaply, easily and quickly.





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Thank You

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