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THE TASMANIAN AGRI-FOOD SCORECARD: QUANTIFYING AGRI-FOOD PRODUCTION AT THE STATE LEVEL

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QUANTIFYING AGRI-FOOD PRODUCTION AT THE STATE LEVEL

Abstract

Agriculture, aquaculture and food production are significant contributors to the Tasmanian economy. There are a range of challenges in quantifying the value of food production at the state level, including an absence of data on the value of processed food and interstate trade. The Tasmanian Agri-Food ScoreCard employs a methodology that fills some of these data gaps and reports a range of information, including the value of agri-food production along the value chain and the market destinations into which products are sold.

Keywords: Tasmania, food production, value chain, agriculture, aquaculture

Introduction

Agriculture, aquaculture and food production are significant contributors to the Tasmanian economy[1]. Over the past decade, Tasmania has accounted for 85% of growth in the gross value of Australian aquaculture and has also increased its share of national agricultural value-adding. The growth in the value of agriculture has been almost exclusively driven by expansion in food agriculture as the state's reputation for high quality food and beverages has gone from strength to strength.

The Tasmanian government has identified agri-food production as a key pillar of the Tasmanian economy, setting a bold target to grow the farm gate value of agriculture to $10 billion by 2050 and implementing the Tasmanian Agri-Food Plan to realise step-change in the growth of agriculture, aquaculture and food production.

[1] Food refers to food and beverages.

Given the importance of agri-food production to the Tasmanian economy, information about the volume and value of primary production, the value of food after packing and processing and the value of food sold into interstate and overseas markets is key to tracking the annual growth in food production and analysing the value creation along the chain.

Statistics on the volume and value of primary production are published. However, beyond the primary production sector, reliable information becomes elusive as the value of food and beverage manufactured in the State is not reported. In terms of the market destination of Tasmanian food, international agri-food sales are directly reported but the volume and value of interstate sales are not.

The Tasmanian Agri-food ScoreCard (the 'ScoreCard'), which was developed by Hugh Griffiths, formerly of DPIPWE, in partnership with Primary Industries and Regions South Australia (PIRSA), uses a methodology to calculate these unknown values and estimate the value of Tasmanian agri-food production at different points along the value chain, including total gross and net revenue.

The ScoreCard has been produced by DPIPWE since 2004-05 and has proved a valuable resource to government, industry, academia and the broader community. A number of Key Performance Indicators for DPIPWE are sourced from the ScoreCard and, since 2016, the ScoreCard has been the measure of the State's progress against the Tasmanian Agri-Food Plan.

The Food Value Chain

In the simplest terms, we can conceptualise food production as a chain starting with primary production, followed by processing and packing, and finally distribution to consumers through retail and food service outlets. As food moves along this supply chain, value is added and we can define points at which the value of the product is measured.

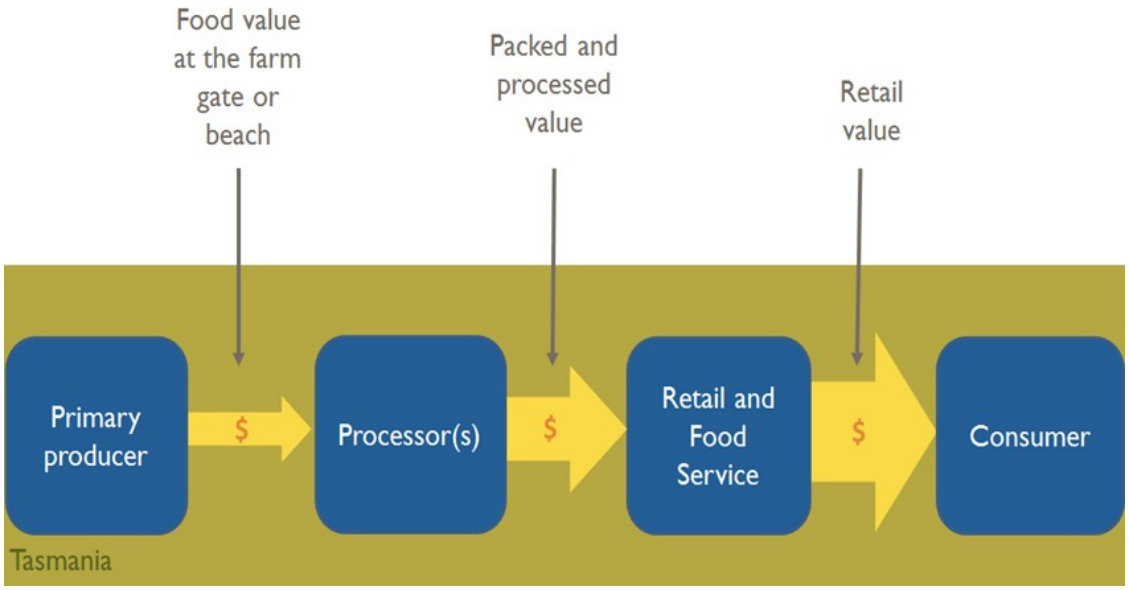

Figure 1. The food value chain

Gross Value and Food Value at the Farm-gate or Beach

The first measure is farm-gate or beach value – it is the value of the product at the point at which it leaves the primary production sector. For potatoes, for example, the farm-gate value is the price per tonne paid to the farmer. For seafood, the equivalent is the 'beach value' – the price paid to the fisherman or the value of the fish when it is harvested on a fish farm. This is also referred to as the gross value of primary production.

The farm-gate value of agriculture can be divided into food farm-gate value and non-food farm-gate value. Crops grown as fodder for livestock have non-food value. Potatoes have food value. Cattle however, have both food value (meat and offal) and non-food value (hides). The gross (beach) value of Tasmanian seafood production is equal to the food value at the beach.

In terms of food production, the key measure of interest is the food value at the farm-gate or beach.

Processed and Packed Value

Value is added to commodity products through processing and packing. In the case of potatoes, approximately 85% of potatoes produced in Tasmania are processed into frozen potato chips and the remaining 15% are packed for fresh sale. Similarly, Atlantic salmon

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undergoes a range of processing from basic cleaning through to processing into oven-ready packaged, frozen fillets.

Some products undergo more complex processing into products such as beer, spirits, cheese or chocolate.

Packing and processing can be a multi-stage process and, in the ScoreCard, the packed and processed value refers to the value of the product after processing that occurs in Tasmania.

Retail value

Finally, through distribution to consumers and further preparation through food service more value is added to the product to give its final value. This is the retail value of the food – in the case of the potato, it is the price paid for potato chips in the supermarket freezer of bags or potatoes in the produce section.

Market destinations

Tasmania produces a large surplus of food. Not all the food produced in the State is processed here. Products are also consumed which are not commercially produced here and some food produced here, such as chocolate, uses a mix of local and imported ingredients. So, there is the added complication of imports and exports occurring along the value chain. This trade can be international or interstate.

For the purposes of the ScoreCard, if the product has not undergone processing into food ready for human consumption (for example, interstate livestock sales and dried hops), it is referred to as a commodity import or export. If the product has been processed and packed into a product ready for human consumption (for example, cuts of meat or beer), it is classified as a food import or export. Imports and exports along the chain are additional key values that need to be known in order to estimate total revenue from Tasmanian food production.

Figure 2 shows a diagram of possible product movements of food products along the chain.

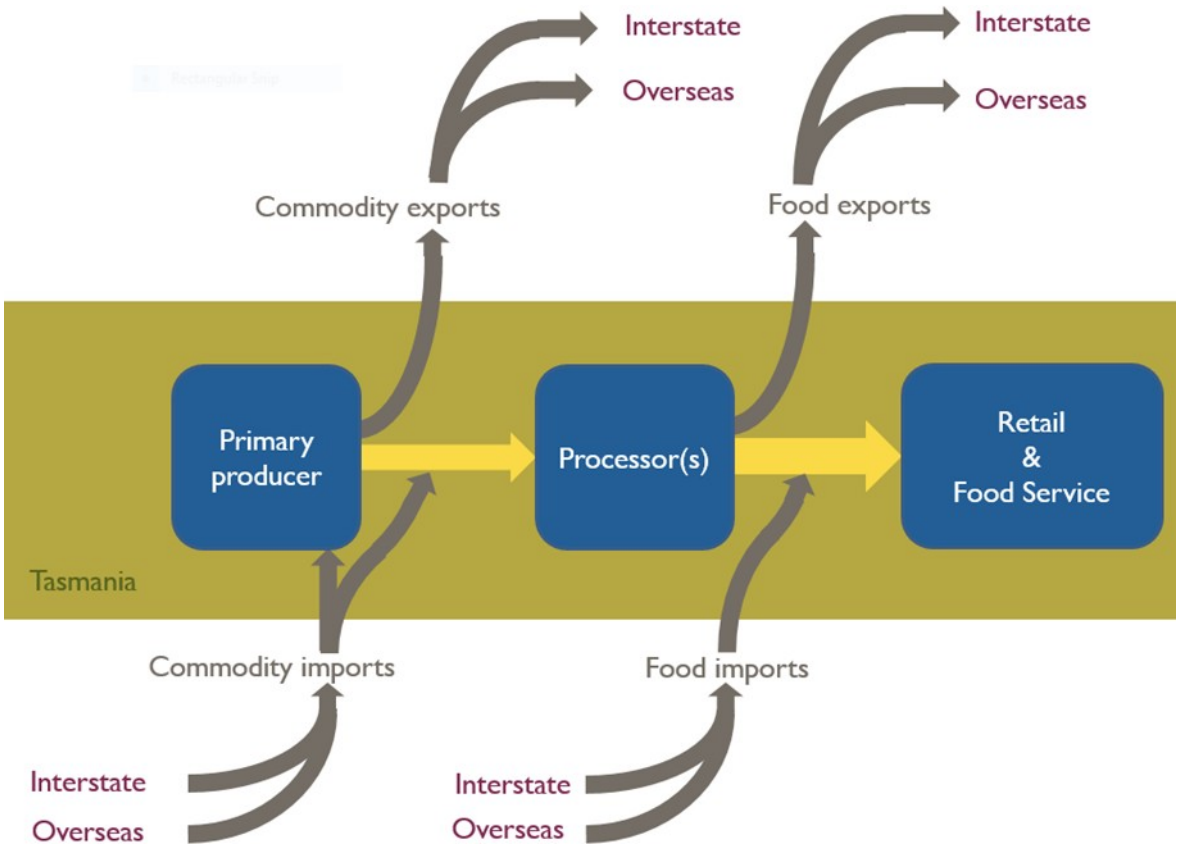

Figure 2. Tasmanian agri-food production value chain

ScoreCard Methodology

The primary question that the ScoreCard seeks to answer is "what is the revenue to the Tasmanian economy from the food value chain?"

Gross food revenue is the sum of food retailed and sold through food service in Tasmania, plus the value of Tasmanian produced food and food commodities sold interstate and overseas (refer to equation 1 below). Food and food commodities imported from interstate and overseas are subtracted from this figure to derive net food revenue (refer to equation 2 below):

$$GFR = R_{Tas} + E \quad (1)$$

$$NFR = R_{Tas} + E - I \quad (2)$$

Where:

GFR is gross food revenue

NFR is net food revenue

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R_{Tas} is the revenue from food and beverage sales within Tasmania

E is the value of Tasmanian produced food and food commodities sold interstate and overseas

I is the value of food and food commodities purchased from interstate and overseas

Gross and net food revenue cannot be readily calculated because two key pieces of data are not reported:

- the value of food processed and packed in Tasmania; and
- the value of interstate trade.

The volume and gross value of agricultural production is reported by the ABS (ABS 2018a, ABS 2018b). The volume and value of fisheries production, collected by the DPIPWE, is reported by the Australian Bureau of Agricultural and Resource Economics and Sciences. From these data, the gross food value of Tasmania's primary production is derived.

Using gross value and volume data reported by ABS and ABARES, along with data from industry, and average wholesale price data, the processed food value is calculated for about 60 individual categories of food to derive the total packed and processed value and volume of Tasmanian produced food.

For each of these food products, Tasmanian consumption is estimated using national food consumption data from a range of sources and the Tasmanian population statistics reported by ABS (ABS 2018c). It is important to remember that this is not the actual quantity of Tasmanian produced food sold in Tasmania – it provides an estimate of the magnitude of the production surplus in order to calculate net interstate sales.

The estimates of Tasmanian production and consumption, along with import and export data sourced directly from ABS, are then used to calculate the volume of net interstate trade as:

$$Net\ interstate\ trade = (production_{Tas} + imports) - (consumption_{Tas} + exports)$$

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Where, in relation to processed food:

$production_{Tas}$ is the volume of food packed and processed in Tasmania

imports is the volume of processed food imported from overseas

$consumption_{Tas}$ is the volume of food consumed by the resident population of Tasmania

exports is the volume of food exported

The value of net interstate trade is calculated from the volume using wholesale price estimates.

The total value of food and beverage sales in Tasmania through retail and food service outlets is reported by the ABS. The quantity of food sourced from Tasmania is used to determine the quantity sourced from outside the state. These calculations are reconciled with a variety of data sources, including household consumption statistics and quantities of freight shipped across Bass Strait.

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Figure 3 shows how the equations for gross and net food revenue relate to the food value chain diagram. Gross food revenue is the sum of Tasmanian food sales, net interstate sales of food and commodities and international food and commodity exports (the sum of A, B and C in Figure 3). Commodity and food imports (D and E in Figure 3) are subtracted from the gross net revenue to give an estimate of net revenue.

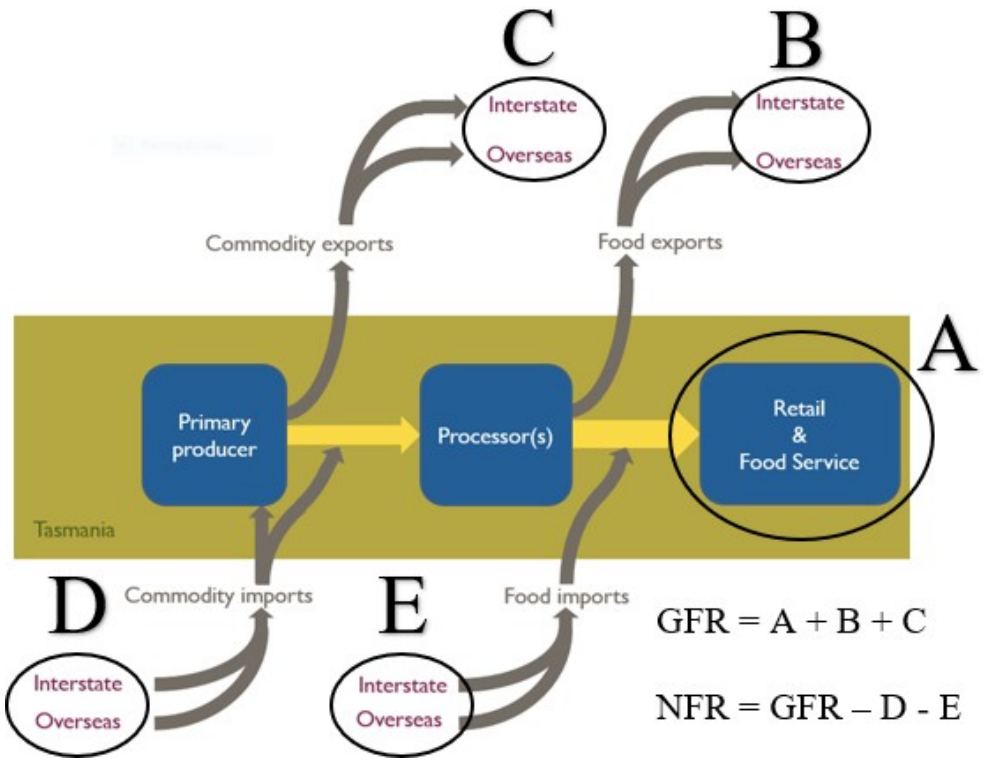

Figure 3. Gross Food Revenue (GFR) and Net Food Revenue (NFR)

Tasmanian Agri-Food ScoreCard 2016-17

The ScoreCard methodology gives rise to a wealth of data, providing value chain information for individual products (eg. potatoes, beef), industry sectors (eg. vegetables, livestock) and total food production for the State. This data is summarised in Table 1 overleaf.

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Table 1. ScoreCard Summary 2016-17 ($ million) (DPIPWE 2018a)

	Field Crops	Livestock	Dairy	Fruit	Vegetables	Seafood	Wine	Chocolate	Total[2]
Food - farm gate/beach value	16.1	421.8	325.8	153.9	264.4	946.9	37.9		2,166.9
Total farm gate/beach value	177.8	548.0	325.8	153.9	264.4	946.9	37.9		2,416.6[3]
Food - processed & packed value	266.9	671.4	474.2	262.4	592.3	1,231.1	119.0	546.0	4,163.2
Overseas Trade									
Commodity Exports	21.7	0.0	0.0	0.0	0.0	0.0	0.0		21.7
Commodity Imports	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	3.8
Food Exports	0.4	175.5	141.3	32.0	16.5	152.3	3.1	44.1	582.2
Food Imports	0.9	0.0	0.0	0.2	0.5	0.7	0.3	0.2	24.3
Net Interstate Trade									
Net Commodity Exports	1.0	49.2	0.0	0.0	0.0	0.0	0.4		50.6
Net Commodity Imports	19.2	74.8	0.0	0.0	0.0	0.0	0.0	68.7	162.6
Net Food Exports	6.6	143.6	200.3	169.9	424.1	979.1	65.3	451.2	2,440.1
Net Food Imports	68.2	132.3	0.4	80.8	20.8	108.6	70.4	0.0	587.8
Tasmanian Food Sales									
Retail Sales	362.5	610.2	236.2	213.7	350.7	131.9	170.3	50.5	2,610.6
Food Service Sales	218.1	98.8	4.8	49.7	95.9	155.4	162.5	8.4	861.5
Net Food Revenue	528.4	870.3	582.2	384.4	866.0	1,309.5	331.0	482.7	5,788.2
Gross Food Revenue	616.7	1,077.3	582.6	465.3	887.3	1,418.8	401.6	554.3	6,566.7

[2] Totals may include items that do not fall into one of the 8 categories listed (eg frozen meals, soft drinks, cooking ingredients)
[3] The total farm gate/beach value is the sum of fisheries data reported by ABARES and gross value of agriculture as reported by the ABS. The sum of the contributors exceeds the total because the wine value sourced from Wine Tasmania is higher than the value reported by the ABS.

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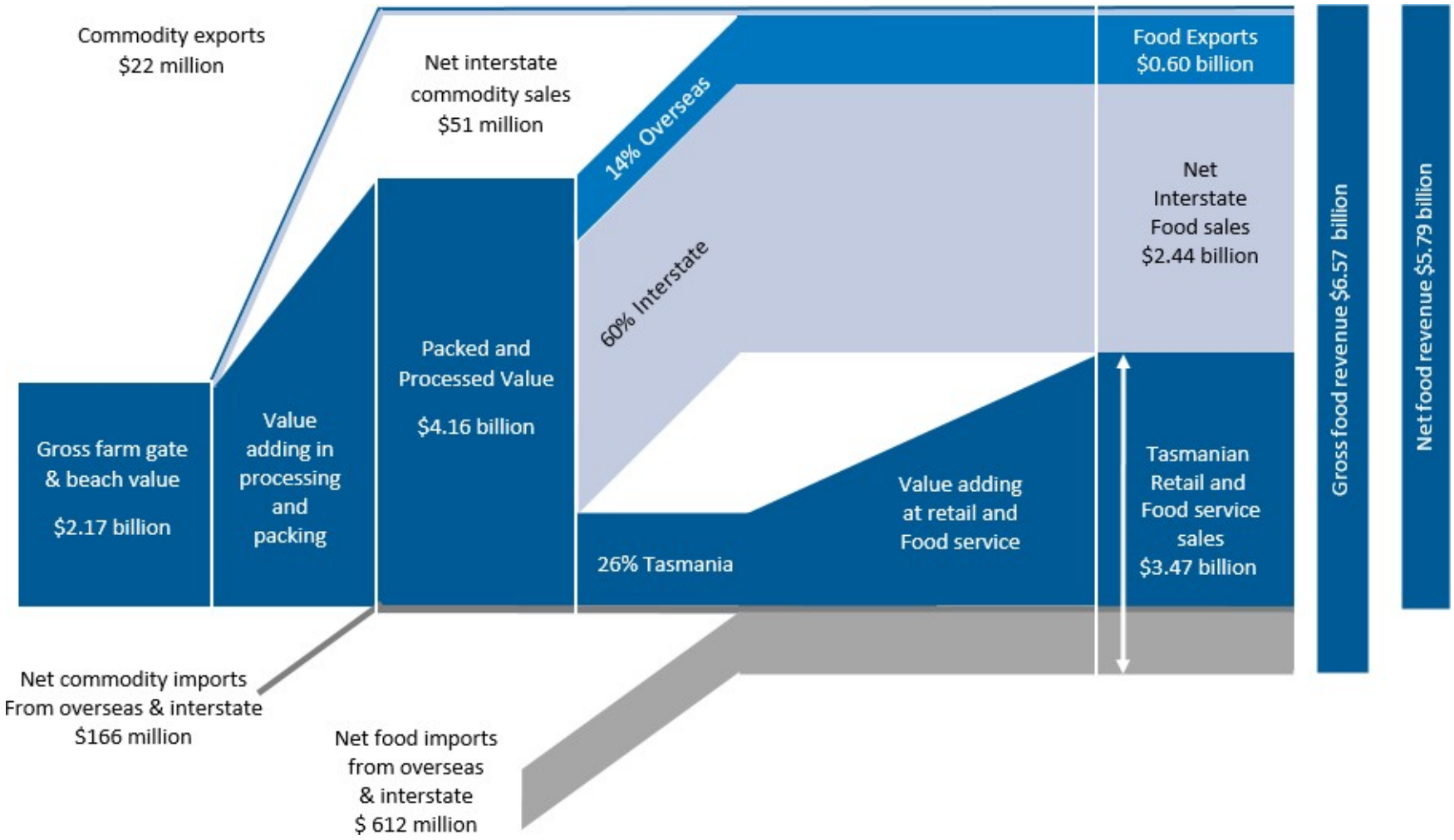

Figure 4. The Tasmanian food value chain 2016-17 (DPIPWE, 2018a)

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Figure 4 summarises the Tasmanian food value chain in 2016-17, showing how the figures in the right-hand column of Table 1 relate to the Tasmanian food value chain.

The gross food value of primary production was $2.17 billion. $22 million worth of food commodities were exported internationally (mainly hops) and $51 million worth of food commodities (mainly livestock) were sold interstate.

$166 million worth of food commodities were identified as imported from interstate and overseas. These imported inputs along with Tasmanian sourced primary food products have value added to them through processing and packing. The value of food packed and processed in Tasmania is worth an estimated $4.16 billion.

By volume, it is calculated that 74% of this production exceeds Tasmanian consumption. ABS export data reports that 14% of food production is exported which leaves 60% as net interstate sales.

The value of international food (and food commodity) exports was $604 million ($0.60 billion). The value of net interstate food sales was $2.44 billion and net interstate commodity sales were worth $51 million ($0.05 billion) giving total net interstate sales of $2.49 billion. Food sold in Tasmania through retail and food service outlets was worth $3.47 billion. Adding Tasmanian sales, net interstate sales and international exports together gives a gross food revenue of $6.57 billion.[4]

Imports of food and food commodities from overseas were worth $28 million ($0.03 billion). Net food and food commodity imports from interstate were estimated at $750 million ($0.75 billion). Subtracting the total $778 million ($0.78 billion) from the gross food revenue, gives net food revenue of $5.79 billion.

Although the calculation of gross and net food revenue is the primary question answered by the ScoreCard methodology, there is a wealth of additional data collected and generated which is of value to government, industry, academia and the general public.

Analysis of the data is published annually in the *Tasmanian Agri-Food ScoreCard* (DPIPWE, 2018a). This document also reports and analyses non-food agricultural production. A succinct summary of the data is published in the 4-page *Tasmanian*

[4] Values may not sum to the total due to rounding.

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AgriFood ScoreCard Snapshot (DPIPWE, 2018b). Both documents can be downloaded from the DPIPWE website.

Challenges

Collection of reliable data is an ongoing challenge in generating the ScoreCard. Specific challenges include reliability and availability of primary production data, place of production attribution errors, maintaining data sources in industry and government and changes that affect underlying assumptions.

At the farm gate level, total volume and value of agricultural production is sourced from ABS. However, data is not reported for all categories of production and data may be suppressed (not reported) for some categories if there are only a small number of producers. In addition to this, ABS data is collected only from agribusinesses with an estimated value of agricultural operations (EVAO) of $40 000 or more. A census of all these businesses is conducted every 5 years and surveys of a sample of these businesses are conducted between census years. In survey years, a reduced range of products are reported, often with a high standard error at the level of the individual commodity or product.

Where reliable alternative data sources are available for individual food categories, such as Hort Innovation's Australian Horticulture Statistics Handbook and Wine Tasmania's wine producer survey, those sources have been used to supplement ABS data. However, total gross value reported in the ScoreCard continues to be sourced from ABS. As a result, there is frequently a discrepancy between the sum of the values of individual categories (eg. apples, berries, cherries) and the total value reported by ABS (eg horticulture).

Many agribusinesses operating in Tasmania are headquartered interstate. Attribution of their production to the state in which their ABN is registered may also explain statistical inconsistencies. This appears to be a particular issue in relation to the attribution of exports. Where this does occur, the ScoreCard captures these values as net interstate sales.

A range of data is collected directly from industry and the support and cooperation of individual businesses, which is vital to the accuracy and reliability of the ScoreCard, is acknowledged. Some key data is also collected from other government agencies. As a result, data sources may be gained or lost as a result of changes in corporate policies, government policy and legislation.

A final factor presenting a challenge to the ScoreCard methodology is the growth in the number of visitors to the State in recent years, relative to the number of Tasmanian residents. Tasmania, which has a resident population of just over half a million people, received 1.3 million visitors in 2017-18. This results in a discrepancy between the volume and value of food consumed by Tasmanian residents (a key value in the ScoreCard) and the value of food sold in Tasmania. This challenge may also be an opportunity if the ScoreCard can reliably provide an additional source of data on the value of food sales to visitors to the State.

The ScoreCard undergoes continuous improvement, not only to identify and refine data sources, but also to improve reconciliation processes and incorporate statistics on new industries as they reach threshold levels and data becomes available.

Conclusion

The Agri-Food ScoreCard provides a valuable method of estimating the revenue to the Tasmanian economy from food production, overcoming a range of data gaps and generating a wealth of information about the state's food value chains. It provides a way of reporting widely the Tasmanian Government's progress against its Agri-Food Plan. The ScoreCard is reliant on data sourced from government, industry peak bodies and individual businesses. It is an example of a collaborative approach to generate a valuable resource used widely by government, industry, academia and the broader community.

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