



MURRAY DAIRY TRENDS REPORT

2019/20

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FOREWORD

Dairy businesses in the Murray Dairy region are undergoing significant change to adapt to a rapidly changing operating environment characterised by volatility and uncertainty around climate, markets and water policy.

This report provides the necessary data to monitor the trends in the Murray Dairy region to enable research, extension, and other service industries to develop and provide the programs necessary to support these changes.

Data provided in this document will be updated on an annual basis when data becomes available.

FARM FACTS

The Murray Dairy region is home to 1,100 dairy farms milking 320,000 cows with an average herd size of 263 cows and producing 1872 ML of milk. The region spans an area north of the Great Dividing Range as far as Swan Hill in Victoria and Deniliquin in NSW, west to Mitiamo and east to Corryong. The region operates in three distinctly different sub regions, the Goulburn Murray Irrigation District (GMID), north-east (NE) Victoria, including the Alpine Valleys, and the southern NSW Riverina, also known as NSW Murray.

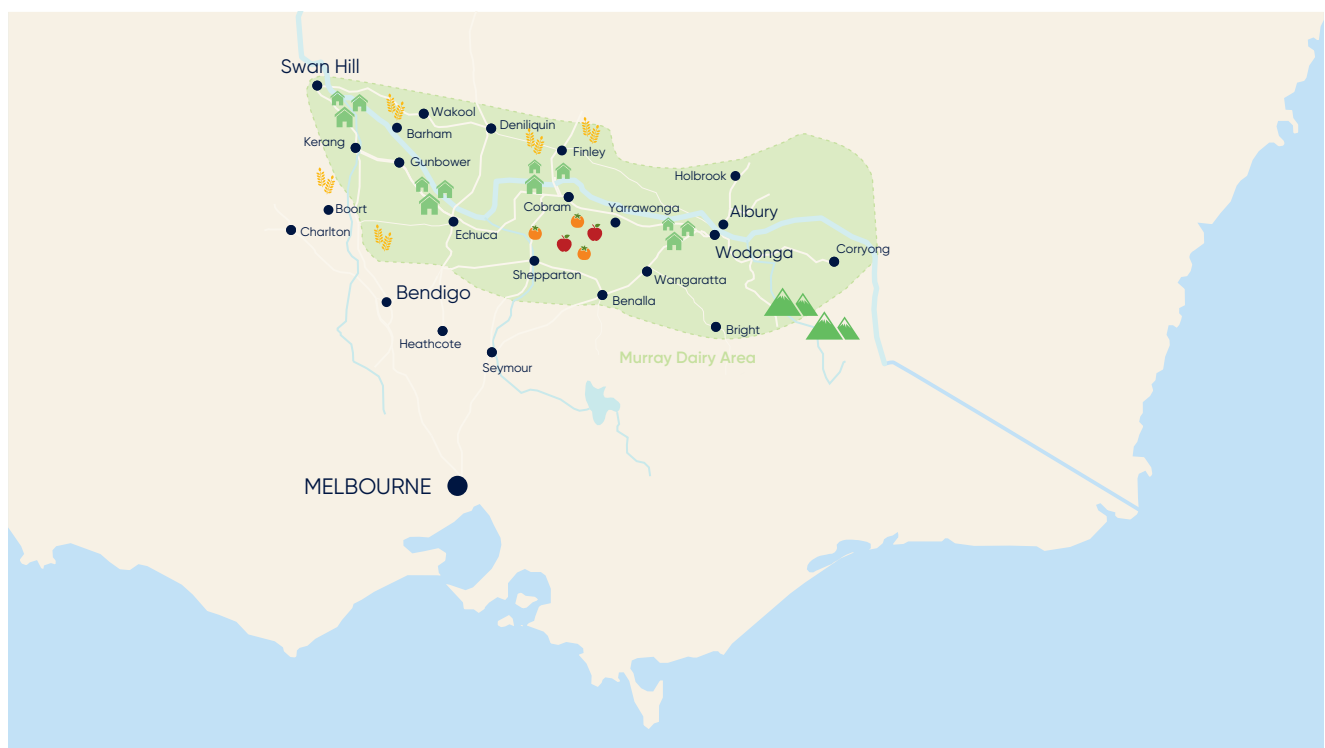
Background

The industry is in transition, which presents opportunities as well as challenges. Since the Millennium drought, dairy farms and milk processors have continued to consolidate. This is consistent with national trends since 2000 toward fewer but larger and more efficient dairy farms. Dairy farm systems in irrigation districts are also diversifying away from a historical reliance on intensively irrigated pastures in response to national water policy reforms and climate change. Rising input costs, volatile seasonal conditions, and challenging commodity market trends have somewhat dampened farmer confidence.

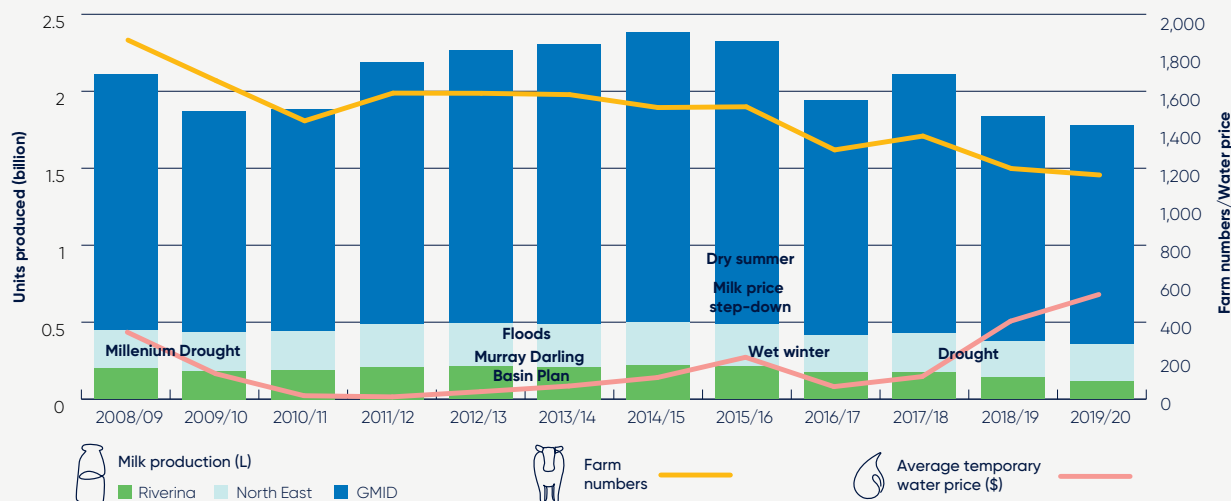
The future operating environment is likely to be characterised by increasing variability and volatility, requiring adaptive management at all industry levels.

This has prompted many Murray Dairy farmers, particularly those in the irrigation areas of the GMID and southern Riverina, to seek alternative farming systems to meet the challenges brought by rising costs of irrigation water and feed costs. This has seen the introduction of more Total Mixed Ration (TMR), Partial Mixed Ration (PMR) and Total Component-fed Ration (TCR) systems being adopted. It has also seen the increase in infrastructure and equipment investment to support these types of systems, including feedpads and other feeding infrastructure, housing, shade and shelter. This has also corresponded with the introduction of a whole range of alternative forage options to drive greater flexibility and increased water use efficiency.

Figure 1 Map of Murray Dairy Region



A BRIEF HISTORY



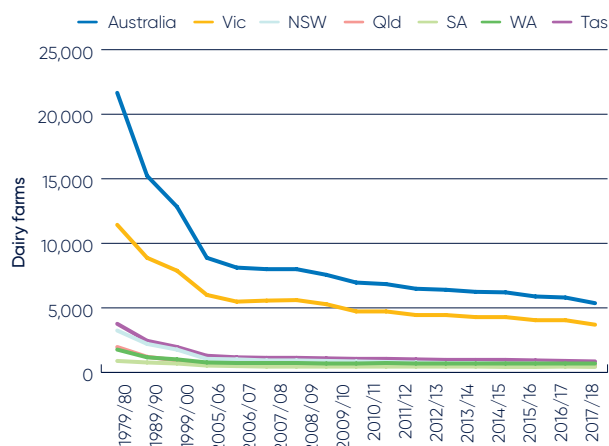
Source: Dairy Australia

Registered dairy farms

The number of dairy farms in Australia has fallen by almost three quarters, from 21,994 in 1979/80 to 5,213 in 2018/19. Victorian numbers have dropped from 11,467 to 3516 over the same period. Murray Dairy farm numbers have followed a similar trend falling to 1167 in 2019/20.

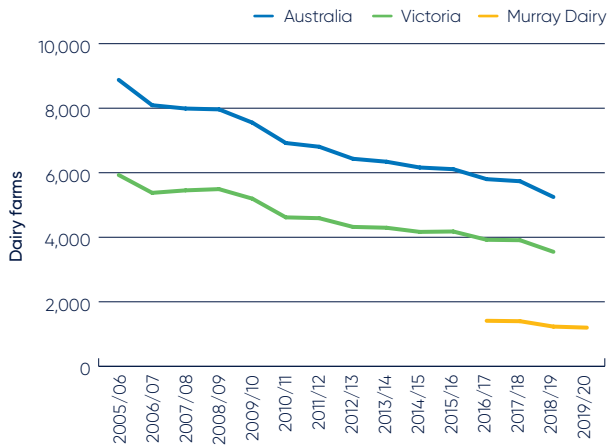
Changing business practices have seen a shift to larger, more intensive operating systems with greater economies of scale. While the number of farms across Murray Dairy has decreased, the average herd size is growing. Despite the increased volatility in input costs driven by water markets for most of the region, exit rates have remained consistent with other dairying regions in Victoria and across Australia.

Figure 2 Dairy farm numbers by State 1979–2018



(Dairy Australia 2019b)

Figure 3 Australian, Victorian and Murray Dairy farm numbers 2005-19

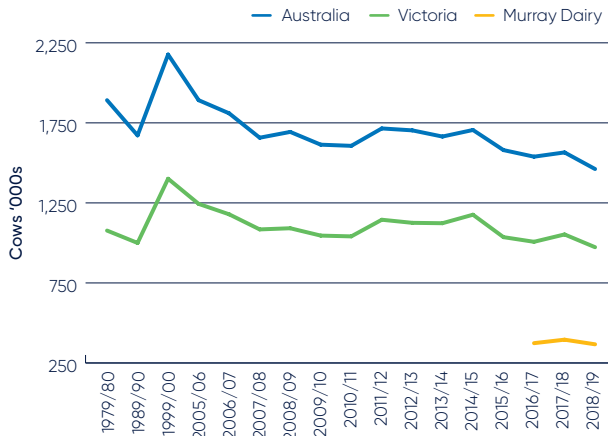


(Dairy Australia 2019b) and Sam Leishman pers com Dairy Australia

Number of dairy cows

There were 320,000 cows in milk and dry in the Murray Dairy in 2018/19, which is 22% of the national herd of 1.4 million. The average herd size in 2018/19 is 263. Over the previous 19 years, cow numbers have steadily decreased after peaking at 2.2 million in 2000. The rate of decline has flattened over recent years.

Figure 4 Dairy cows in Australia, Victoria and Murray Dairy 1979-2019

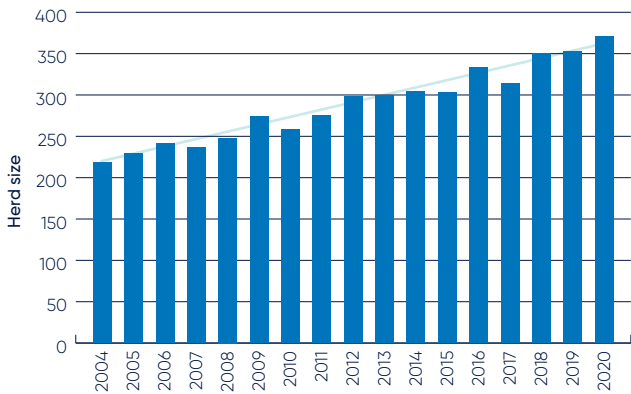


(Dairy Australia 2019b)





Figure 5 Australian herd sizes 2004–2020



(Down To Earth Research and Dairy Australia 2020)

18% of Murray Dairy farms have herds of 150 cows or less.
50% have medium sized herds of 150–300 cows.
32% have herds of 300 cows or more.

Figure 6 Herd sizes in Murray Dairy

Murray Dairy Herd Size 2019/20	%
Small herd (<150 cows)	18%
Medium herd (150 to 300 cows)	50%
Large herd (301 to 500 cows)	15%
X-large herd (501 to 700 cows)	10%
XX-large herd (700+ cows)	7%
Average herd size 2019/20	319

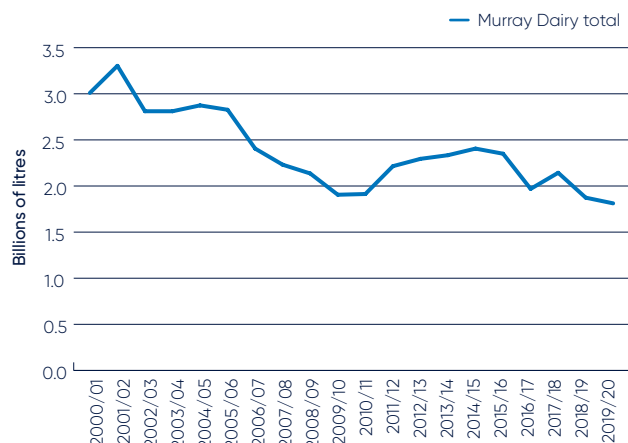
(Down To Earth Research and Dairy Australia 2020)

Despite the increase in average herd sizes over the longer term, one of the variables placing a limit on total milk production in recent years has been a relatively static national herd size. One factor contributing to this situation is the increased volatility in farm cash incomes. This has led many farmers to participate in the export heifer trade or sell dairy cows for slaughter in an attempt to stabilise farm income. In 2018/19 the national herd decreased as challenging seasonal conditions resulted in an increase in farm exits and a move to smaller herd sizes on many farms. Contrary to this, Murray Dairy herd size has increased each year for the last 3 years.

Milk production

Murray Dairy milk production was 1.8 billion litres in 2018/19.

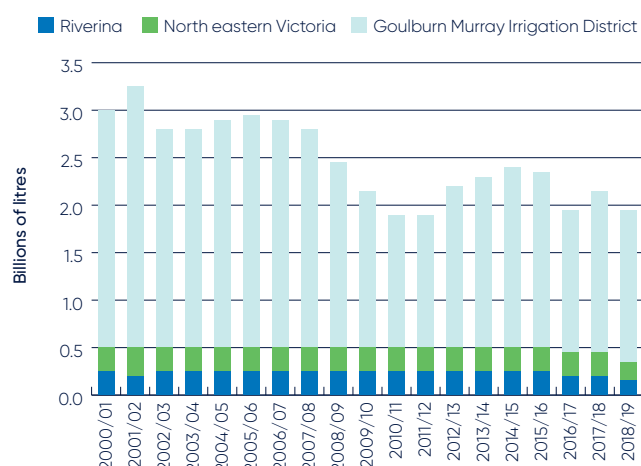
Figure 7 Murray Dairy milk production 2000/01 to 2019/20



(Dairy Australia 2019b)

The region's milk production peaked in 2001/02 at 3.3 billion litres but declined significantly over the millennium drought to a low of 1.9 billion litres in 2009. Milk production in the Murray Dairy region then began to recover over the following 5 years rising to 2.4 billion litres in 2014/15 before dropping again to 1.8 billion litres in 2018/19. This trend is mostly a reflection of the GMID production because 80% of the milk comes from this sub region. The Riverina produces approximately 8% and the North East approximately 12% of the Murray Dairy region milk.

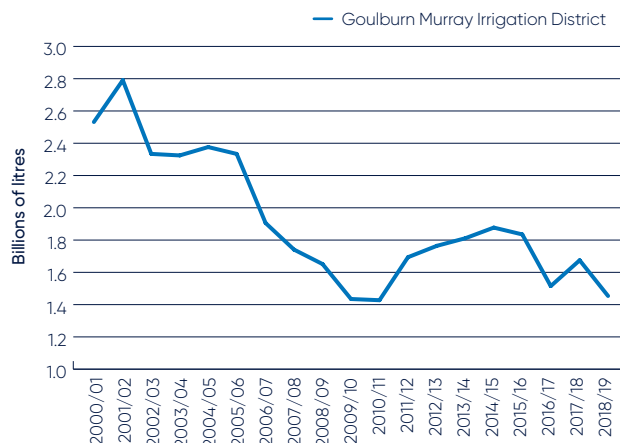
Figure 8 Murray Dairy milk production by sub-region



(Dairy Australia 2019b)

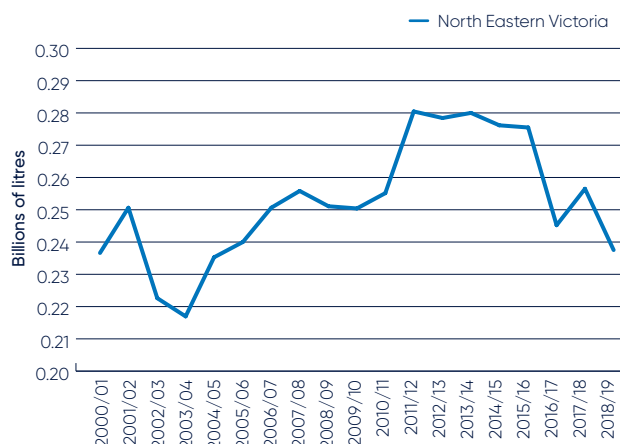
The three regions have had very different production histories over the last 20 years, this reflects the different operating environment in which the milk is produced.

Figure 9 Goulburn Murray Irrigation District milk production 2000/01 to 2018/19



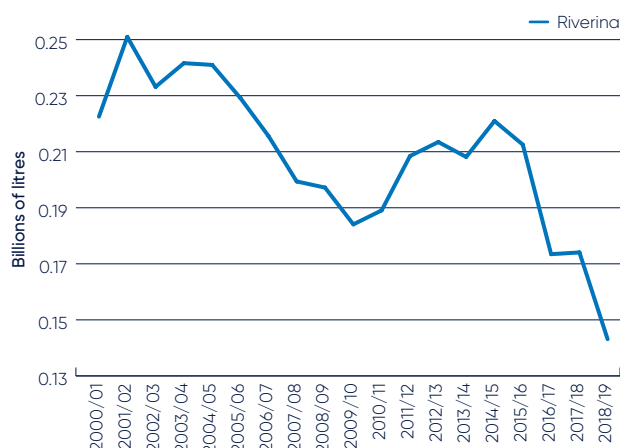
(Omstedt 2020)

Figure 10 North-eastern Victoria milk production 2000/01 to 2018/19



(Omstedt 2020)

Figure 11 Riverina NSW milk production 2000/01 to 2018/19

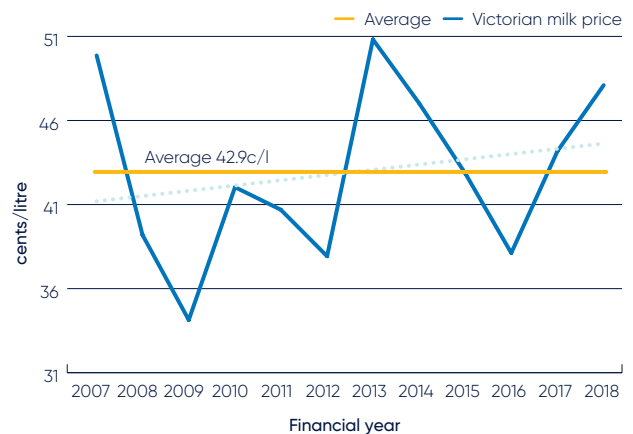


(Omstedt 2020)

FARMGATE MILK PRICES

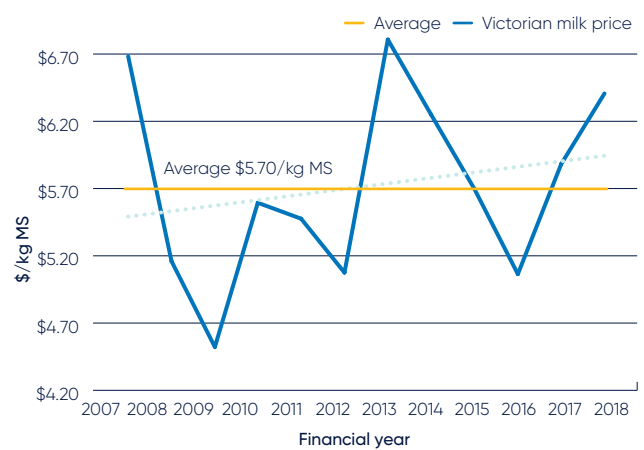
In the Murray Region, milk price has fluctuated from year to year with only a very small upward trend in price and an average price of 42.9c/l or \$5.70/KGMS between 2007/08 and 2018/19.

Figure 12 Victorian milk price 2007–18 in cents per litre



(Dairy Australia 2019b)

Figure 13 Victorian milk price 2007-18 in \$/Kg MS



(Dairy Australia 2019b)

Competition for milk among processors also influences farmgate milk prices from season to season. The Murray Dairy region has 12 manufacturers, including all the large companies that process milk in Australia.

Figure 14 Manufacturers in the Murray Dairy Region 2019



Manufacturer	Location
Lactalis Group	Bendigo
Bega Cheese	Tatura
Australian Consolidated Milk	Kyabram
Fonterra Australia	Stanhope
Freedom Foods Group	Shepparton
Bega Cheese	Strathmerton
Saputo Dairy Australia	Cobram
Milawa Cheese Co	Milawa
Saputo Dairy Australia	Kiewa
Gundowring Fine Foods	Gundowring
Kyvalley Dairy	Kyabram
Riverina Dairy	Albury
Jonesy's Dairy Fresh	Barham

(Dairy Australia 2019a)

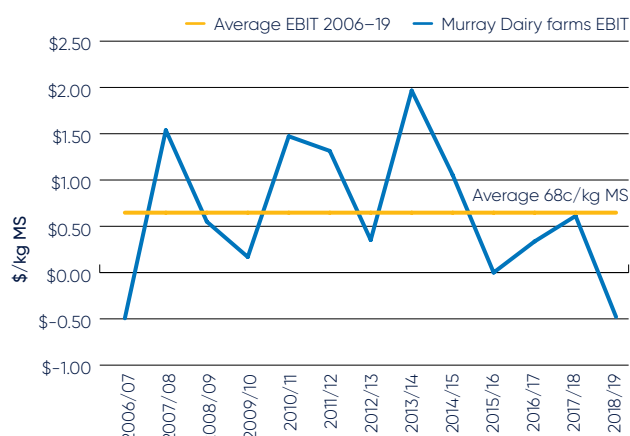
In recent years additional investment in manufacturing capacity has occurred at the same time as milk production has been declining, creating strong competition for milk between manufacturers.

Financial performance

In 2018/19 the financial performance indicators in the Murray Dairy region fell to the lowest for 13 years with a RoTA of -1.7%, EBIT of \$24,000, Return on Equity of -7.4% and net farm income of -\$85,000.

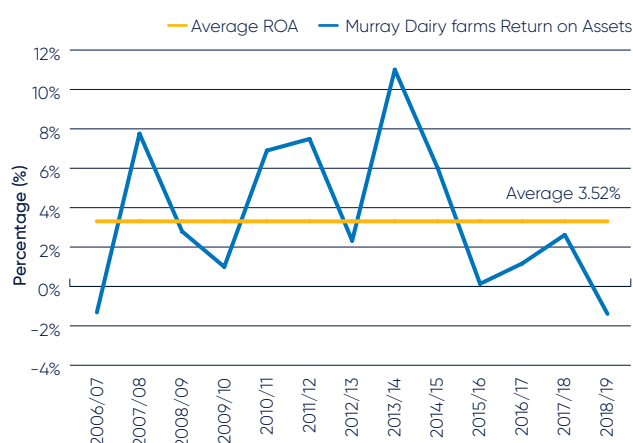
Australian Dairy Plan is recommending that an EBIT of \$1.50/Kg MS should be set as an industry target. This suggests that \$1.50 will allow farms to cover interest and lease costs then have money left to reinvest or repay debt. Murray Dairy farms as measured by the Dairy Farm Monitor Project have reached this target only 3 times in the past 13 years.

Figure 15 Murray Dairy farms EBIT 2006–2019



(Agriculture Victoria and Dairy Australia 2019)

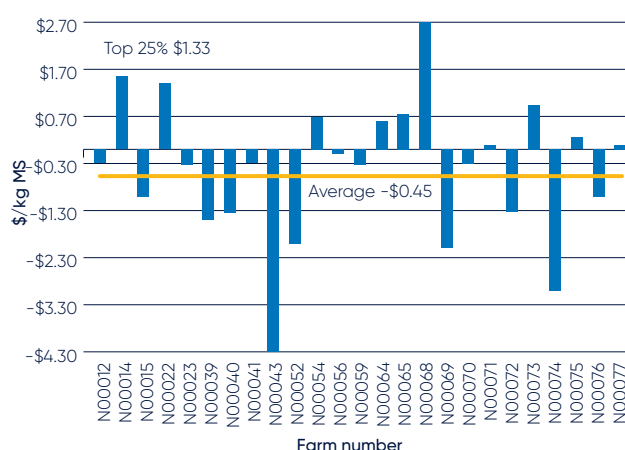
Figure 16 Murray Dairy farms Return on Assets 2006–2019



(Agriculture Victoria and Dairy Australia 2019)

Despite the low average EBIT of -\$0.45/Kg MS achieved in season 2018–19 there was a large variation in individual performance. EBIT ranged from -\$4.28/Kg MS to \$2.68/Kg MS. The top 25% were able to achieve an EBIT of \$1.33/Kg MS in 2018/19 despite the impact of a challenging season. This highlights that focusing on the average EBIT in any year, or even the trend in average EBIT over time, fails to identify the large variation between individual farms.

Figure 17 EBIT for individual farms in DFMP Northern Victoria 2018/19



(Agriculture Victoria and Dairy Australia 2019)

The Dairy Farm Monitor Project data identified that the top 25% were able to keep their variable costs 24% lower and their overhead costs 10% lower than the average. They also received 3% more for their milk than the average. This data indicates the financial areas where the top 25% of businesses were able to achieve a better result. It does not however indicate how they achieved that result. Further, more detailed investigation is required to determine how these businesses utilised their resources in a more efficient way. These learnings can be used to identify systems and strategies that remain resilient in a wide range of seasonal conditions.

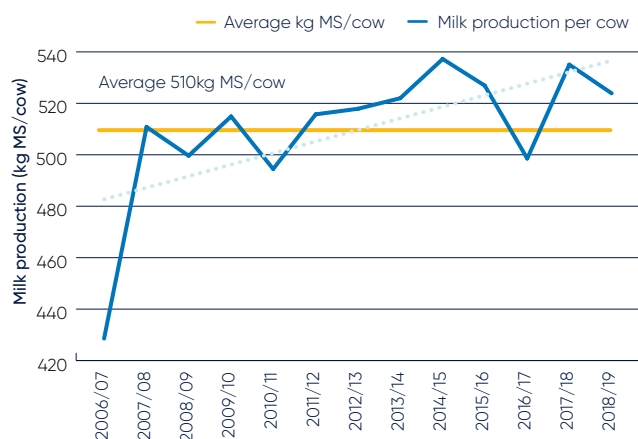
FARM PRODUCTION PERFORMANCE

The 2018/19 season presented a number of business challenges for Murray Dairy farmers. Rainfall was below average, receiving 69% of the long-term average. As a result, many farm businesses purchased additional feed and used carry over water or water purchased on the temporary market to manage the dry season. The irrigation season finished at 100% allocation on the Goulburn and Victorian Murray systems of the GMID and a zero allocation on the NSW Murray River general security in the Riverina. Temporary water reached a median price of \$470/ML contributing to a 37% increase in feed costs to \$4.40/kg MS.

Per cow production

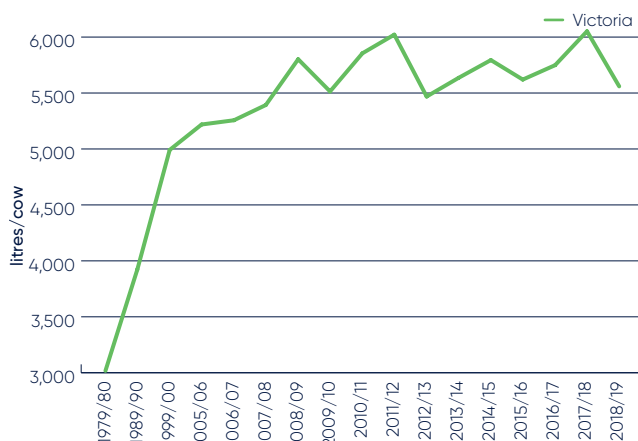
The milk yield per cow in Northern Victoria as measured by the Dairy Farm Monitor Project was 524kg MS/cow in 2018/19 and has not changed significantly since 2007, averaging 510kg MS per cow since 2006. This matches national industry figures from Dairy Australia.

Figure 18 Milk production Kg MS per cow in Murray Dairy 2006–18



(Agriculture Victoria and Dairy Australia 2019)

Figure 19 Victorian milk production per cow 1979–2019

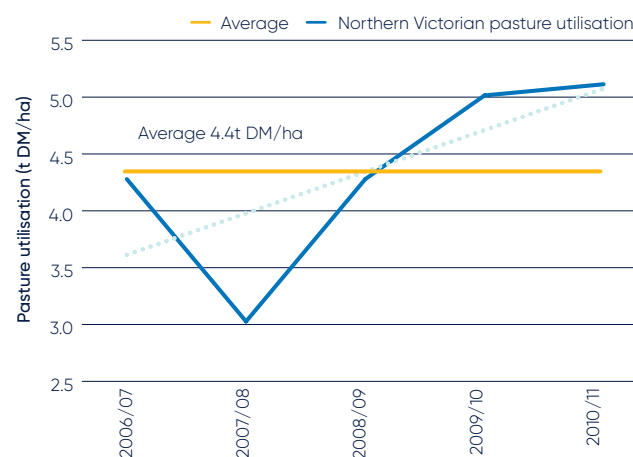


(Dairy Australia 2019a)

Pasture utilisation

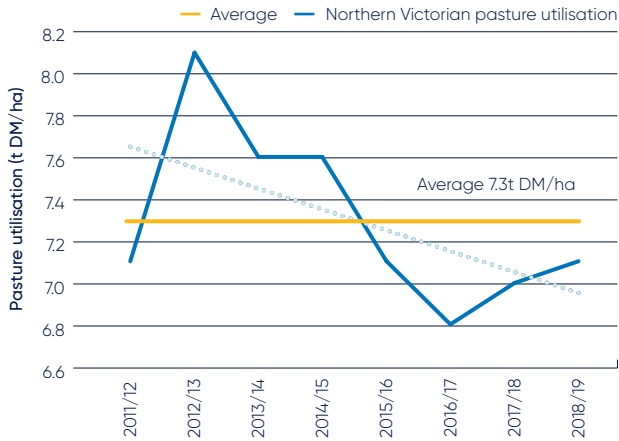
Pasture utilisation for the Murray Dairy region averaged 8.1 T DM/Milking Ha in 2012/13 and has been trending downwards since 2012 achieving an average of 7.3 T DM/Milking Ha over the past 8 years.

Figure 20 Pasture utilisation for Northern Victoria farms from 2006–10 T DM/Total Ha



(Agriculture Victoria and Dairy Australia 2019)

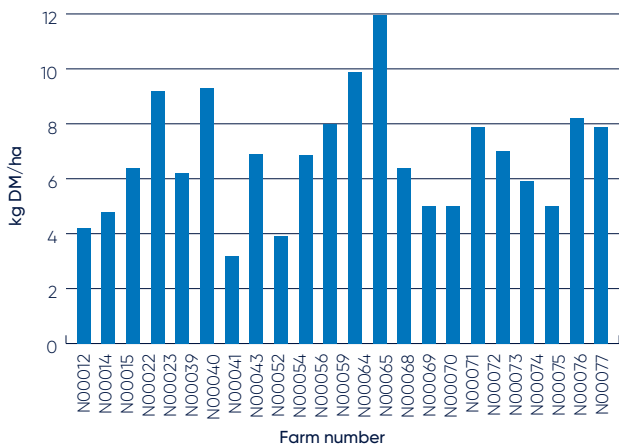
Figure 21 Pasture utilisation for Northern Victoria farms from 2010–2018/19 T DM/Milking Ha



(Agriculture Victoria and Dairy Australia 2019)

While pasture utilisation in 2018/19 of 7.1 T DM/Ha has not changed significantly from the 9–year average of 7.3 T in this study, individual farms vary significantly in their yield.

Figure 22 Estimated grazed pasture DM on milking area – individual farms DFMS 2018/19

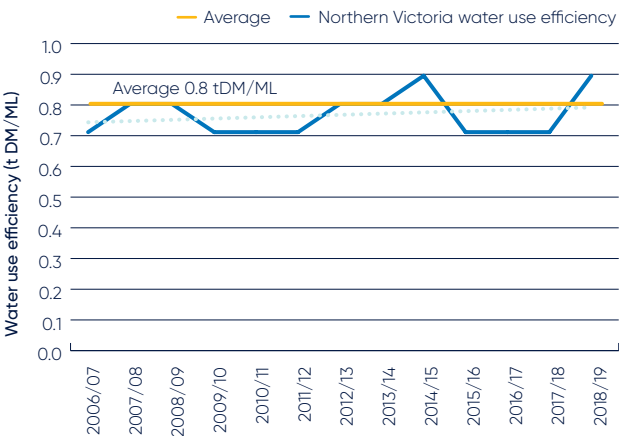


(Agriculture Victoria and Dairy Australia 2019)

Water use efficiency

Water use efficiency has remained consistent in northern Victoria over the last 13 years since 2006/07 at an average of 0.8 T DM/ML, achieving a yield of 0.9 T DM/ML in 2018/19. This figure ranged from a low of 0.6 T DM/ML to a high of 1.3 T DM/ML in the 2018/19 season. Other work as part of the Accelerating Change project have identified many farms in the Murray Dairy region achieving 2 T DM/ML or better. (Murray Dairy 2019)

Figure 23 Water use efficiency for Northern Victorian dairy farms 2006–18 T DM/Ha

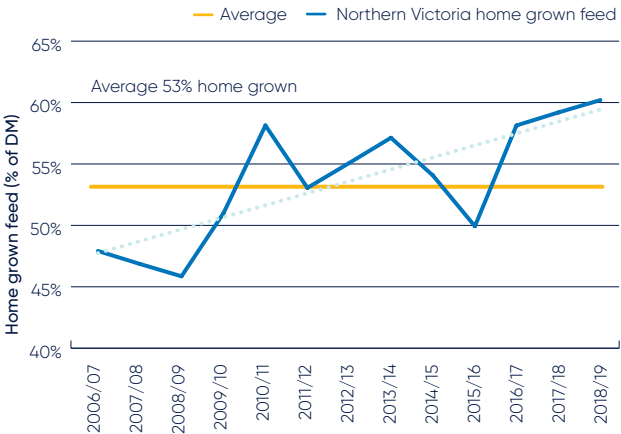


(Agriculture Victoria and Dairy Australia 2019)

Home grown feed

There has been a small but increasing trend towards growing and using more home grown feed.

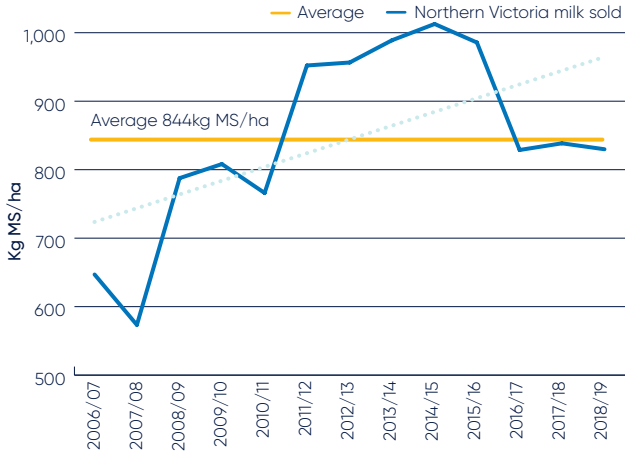
Figure 24 Northern Victoria % of home grown feed 2006–19



(Agriculture Victoria and Dairy Australia 2019)

Production per hectare

Figure 25 Northern Victoria Kg MS/Ha 2006/7– 2018/19



(Agriculture Victoria and Dairy Australia 2019)

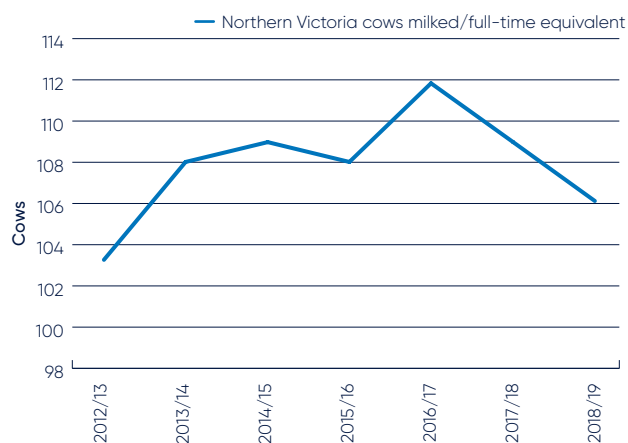




Cows milked per person

Labour efficiency at milking time has remained relatively consistent over the last 7 years staying in the 100–112 cows/FTE in northern Victoria in 2018/19.

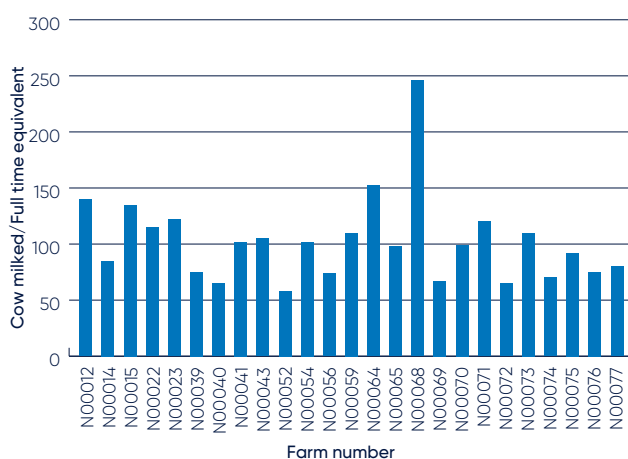
Figure 26 Cows milked/full time equivalent 2012/13 to 2018/19



(Agriculture Victoria and Dairy Australia 2019)

However, some variation occurs at the individual farm level with northern Victoria ranging from a low of 64 cows/FTE up to 243 cows/FTE.

Figure 27 Cows milked/full time equivalent for individual farms

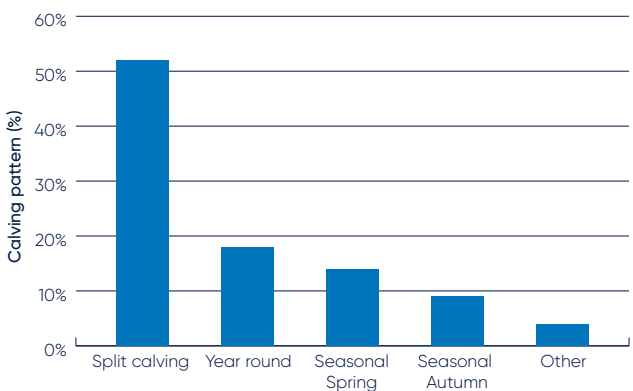


(Agriculture Victoria and Dairy Australia 2019)

CALVING PATTERN

Murray Dairy farms are predominantly split calving (53%) with a significant proportion calving all year round (18%) and seasonally in the spring (15%). A lesser number of farms seasonally calve in the autumn (9%).

Figure 28 Murray Dairy calving pattern 2018/19



(KG2 Agdata Sales and Marketing 2019)

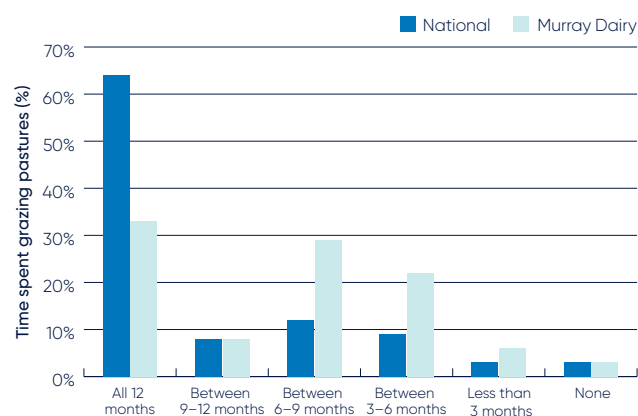


FEEDBASE TRENDS

Pastures

Significant numbers of farmers do not graze pasture for a full 12 months. This indicates that pasture as a feed for cows in the Murray Dairy region is significantly less than it has been in the past. It also indicates that substantial numbers of farms feed alternatives to grazed pastures for significant periods of time.

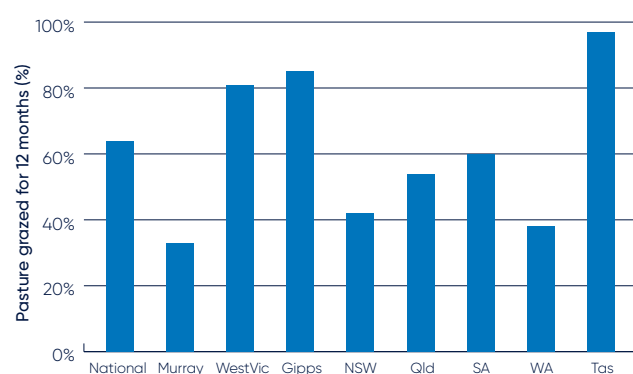
Figure 29 Time spent grazing pasture



(Down To Earth Research and Dairy Australia 2020)

Nationally pasture was grazed by at least some of the milking herd throughout the past year on 97% of farms, most commonly for all 12 months (64%). Looking only at the national figure can be misleading as it indicates a majority graze for the full 12 months. When this is viewed at a regional level, WestVic, Gippsland and Tasmania have a large percentage of their farms that graze pastures for 12 months. Other regions such as Murray Dairy, NSW, WA have most farms that do not graze pastures for the full 12 months.

Figure 30 Pasture grazed for 12 months

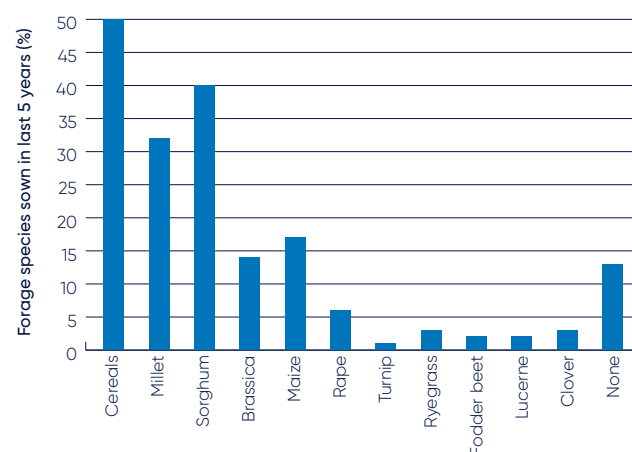


(Down To Earth Research and Dairy Australia 2020)

Alternative forages

87% of Murray Dairy farmers have sown a forage crop within the last 5 years. 99% have sown some new crop or pasture in the last 5 years. 50% of Murray Dairy farmers have sown winter cereals in the last 5 years. 40% of Murray Dairy farmers have sown sorghum (32% have sown millet) and 17% have grown maize. Brassica sown was 14%.

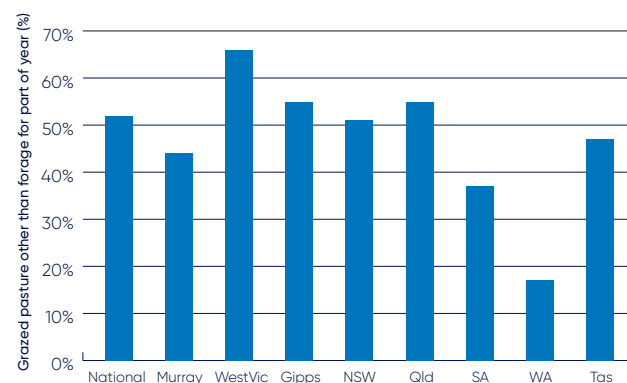
Figure 31 Forage species sown in Murray Dairy in the last 5 years



(KG2 Agdata Sales and Marketing 2019)

44% of the Murray Dairy farmers graze alternative forages such as lucerne, millet, sorghum, and other forage crops at some stage of the year.

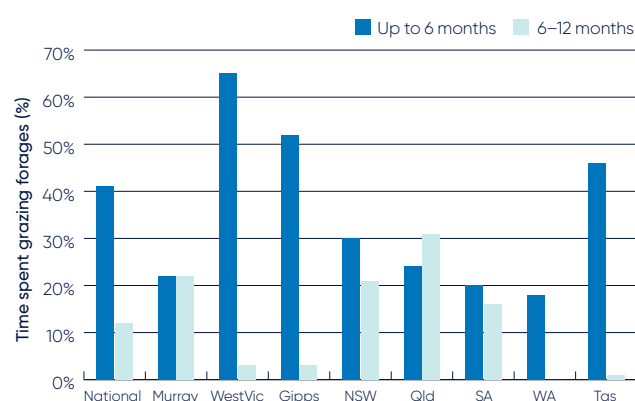
Figure 32 Grazed a forage other than pasture for some part of the year



(Down To Earth Research and Dairy Australia 2020)

Regardless of grazed species, the Murray region spends significantly less time grazing forage directly compared to other regions. The high pasture feeding regions of Gippsland, Western Victoria and Tasmania grazed forages other than pasture (such as lucerne, turnips, millet or sorghum) for up to 6 months, however very few grazed forages beyond 6 months. (WA also has this pattern despite not grazing pastures for long periods). Other regions such as Murray Dairy, NSW, Qld and SA have just over 20% of farms that continue to rely on grazed forages for 6–12 months.

Figure 33 Time grazing forages



(Down To Earth Research and Dairy Australia 2020)

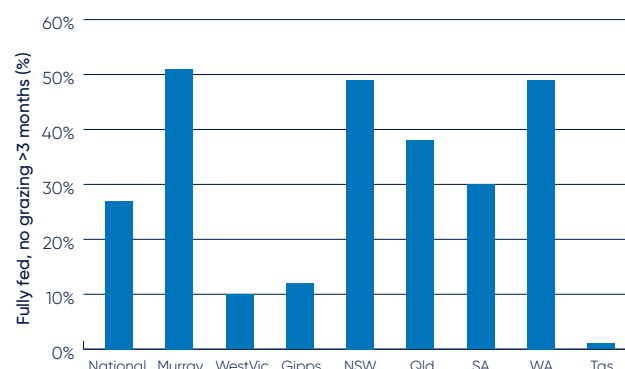
Fully feeding without grazing pasture or forages

In Murray Dairy region 60% of milking herds were fed either a Total Mixed Ration (TMR), a Partial Mixed Ration (PMR) or a Total Component-fed Ration (TCR) without grazing pastures or forages for some period over the past 12 months.

51% of Murray Dairy farmers fully fed their herd a TMR, PMR or TCR off pasture or other grazed forages for 3 months or longer.

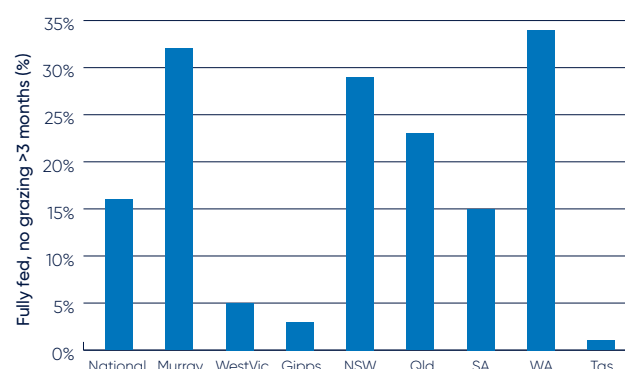
32% of Murray Dairy farmers fully fed their herd a TMR, PMR or TCR and did not graze pasture or forage for 6 months or longer.

Figure 34 Herd fully fed with no grazing for greater than 3 months



(Down To Earth Research and Dairy Australia 2020)

Figure 35 Herd fully fed with no grazing for greater than 6 months



(Down To Earth Research and Dairy Australia 2020)

This indicates that despite the increased use of alternative grazed forages, large numbers of farms in the Murray Dairy region are utilising a range of conserved fodder and other feed inputs to fully feeding their herds without grazing any pasture or forages for significant periods of time.

Among this group, 12% fed their herd entirely without grazing pastures or forages for a full 12 months. (or 7% of all Murray Dairy farms surveyed fed their herd entirely without grazing pastures or forages for a full 12 months.)



Figure 36 Fully fed without grazing for some period



(Down To Earth Research and Dairy Australia 2020)

Interestingly, all dairying regions had a period of time when the herd is not grazing (figure 36).

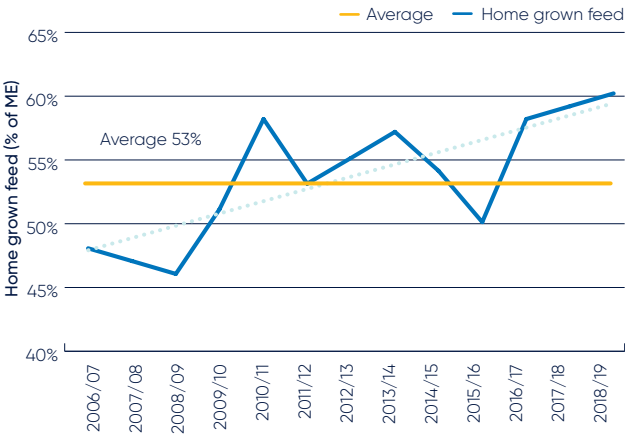
Conserved feed

Murray Dairy Farms conserved 1.6t DM/Ha in 2018/19. The average feed conserved the previous 12 years was 1.2t DM/Ha.

Home grown feed

Between 2006 and 2019 Murray Dairy farms that participated in the Dairy Farm Monitor Program utilised on average 53% of their diet as home grown feed. This has trended upwards over that period and tended to be higher in years of cheaper water and more favourable seasonal conditions. This reliance on purchased feed increases the risk profile of Murray Dairy farms particularly in years of tight feed supply.

Figure 37 Home grown feed as a % of ME



(Agriculture Victoria and Dairy Australia 2019)

FARM SYSTEM TRENDS

The dairy industry in the Murray Dairy region is in transition, which presents opportunities as well as challenges. Since the Millennium drought (1997–2009), consolidation has continued with fewer but larger and more efficient dairy farms. Dairy farm systems in irrigation districts are also diversifying away from a historical reliance on intensively irrigated pastures in response to national water policy reforms and climate change.

From 2015 to 2019, farmers were asked through the National Dairy Farmer Survey (NDFS) to select one of five feed systems that best described their practices.

- System 1: Grazed pasture and other forages and feed LESS than 1 tonne of grain or concentrates per cow per year in the bail (Low concentrates)
- System 2: Grazed pasture and other forages and feed MORE than 1 tonne grain or concentrates per cow per year in the bail (Moderate-high concentrates)
- System 3: Pasture for MOST or ALL OF YEAR and a partial mixed ration on a feed pad (Pasture + PMR)
- System 4: Pasture for LESS THAN 9 MONTHS OF YEAR + partial mixed ration on feed pad (Hybrid)
- System 5: Zero grazing, cows housed and fed total mixed ration (TMR)

In 2019, this data indicated that nationally only 9% of farms operated systems where pasture was fed for less than 9 months and cows supplemented with either a PMR or TMR (System 4 and 5). Murray Dairy results indicated Systems 4 or 5 were in higher number in this region compared to the national average with 14% of farms reporting using either of these feeding systems.

Figure 38 Murray Dairy region 5 feeding systems 2015–2019

Murray Dairy Region	2015	2016	2017	2018	2019
No concentrates	1%	2%	2%	2%	6%
Low concentrates	18%	13%	16%	13%	15%
Moderate to high concentrates	60%	65%	62%	72%	48%
Pasture + PMR	9%	12%	17%	6%	17%
Hybrid	12%	8%	3%	7%	13%
TMR	1%	1%	0%	2%	1%

National Dairy Farm Surveys 2015–19

The Murray Dairy region, in particular, has questioned whether these 5 definitions allow for the variability in feeding regimes evidenced in the region. With this in mind, the 2020 survey asked new questions about specific feeding practices in order to assess the diversity in feed systems. This data has provided new insight for the Murray Dairy region and confirms the 5 system definitions do not adequately represent the practices in the region. A category that has emerged from this latest survey is a group of farmers that fully feed their herd for 3 months or longer but may not have a mixer wagon and feedpad. It also highlights that opportunity exists to provide farmers with additional support and resources to address the diversity in more intensive feeding practices.

Fully fed without grazing

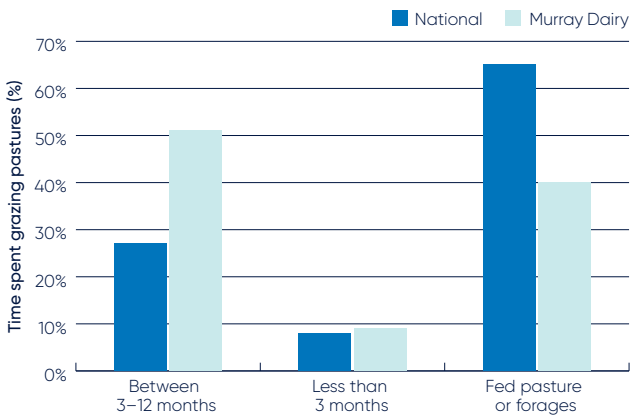
The 2020 Dairy Australia National Dairy Farmer Survey showed that 51% of farms in the Murray Dairy region fully fed their herd off pasture or grazed forages for 3 months or longer. This indicates that feeding systems that comprise total mixed rations (TMR), or total component-fed rations (TCR) are being used to fully feed cows without any grazing for all or part of the year. These feeding systems are different on each farm. They comprise complex systems using complete rations mixed in a mixer wagon and fed to cows in fully housed barns at one end of the spectrum, through to simpler systems where cows are fed hay or silage in a dry paddock or holding area with grain or other concentrates fed in the dairy.

Figure 39 Time that cows were fully fed without any grazing

Fed without grazing	National	Murray Dairy
Between 3 and 12 months	27%	51%
Less than 3 months	8%	9%
Fed pasture or forages	65%	40%

(Down To Earth Research and Dairy Australia 2020)

Figure 40 Time that cows are fed without grazing

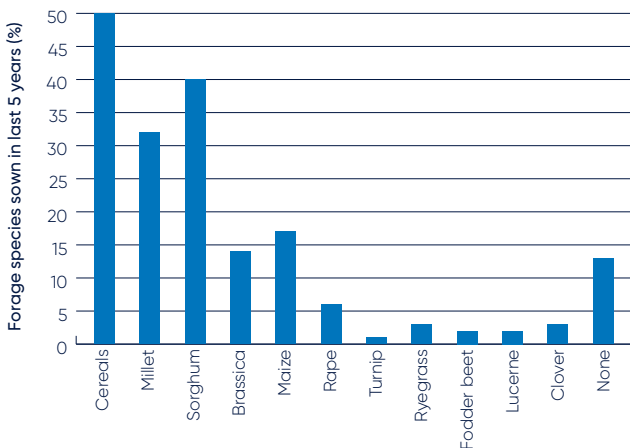


(Down To Earth Research and Dairy Australia 2020)

Grazing pastures

As access to irrigation water becomes more competitive and temporary water price more volatile due to competition or reduced supply, irrigating low yielding perennial pastures during the summer period has become less profitable. Many businesses are modifying their feeding system to incorporate growing alternative forages that offer higher water use efficiency and more flexible irrigation requirements. Only 33% of Murray Dairy farmers grazed pasture for a full 12 months in 2019/20. 59% did not graze pastures for 3 months or longer and 31% did not graze pasture for 6 months or longer.

Figure 41 Forage species sown in Murray Dairy in last 5 years

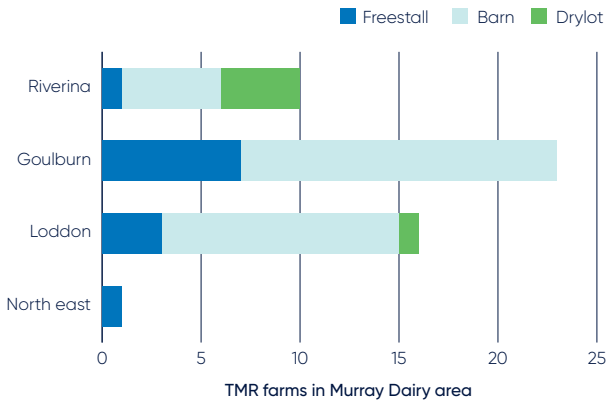


(Down To Earth Research and Dairy Australia 2020)

TMR farms

Murray Dairy has at least 50 TMR farms

Figure 42 TMR farms in Murray Dairy



(McDonald 2020)

FEEDBASE INFRASTRUCTURE

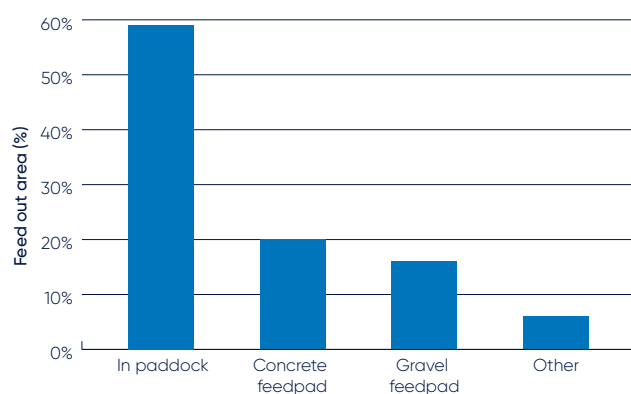
Feedpads

Recent surveys (2019 Feed and Animal Nutrition Survey and the National Dairy Farmer Survey 2020) have identified significant numbers of farms with feedpad infrastructure. The 2019 Feed and Animal Nutrition Survey indicates that 41% of MD farms have a permanent feed out area, 20% have a concrete feedpad and 16% have a gravel feedpad. The National Dairy Farmer Survey 2020 found that 33% of Murray Dairy farms have used a feedpad to feed hay and silage, of which 16% are of concrete construction and 17% of permanent gravel construction.

This type of permanent infrastructure provides significant opportunity for farms to feed large quantities of high-quality feed with minimal wastage. Infrastructure that supports fully feeding is able to achieve high per cow milk yields, increasing feed conversion efficiency through reducing the maintenance component of the diet.

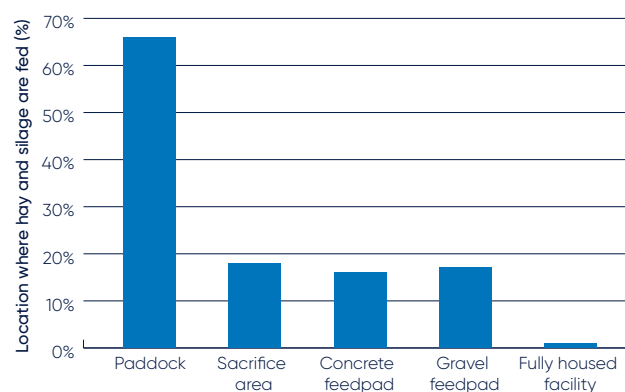
There are 51% of Murray Dairy farms that fully feed their herd without access to grazing pastures or other forages for 3 months or longer. Within this group 21% utilise a concrete feedpad, a further 21% feed on a permanent gravel feedpad, however 55% feed in the paddock and a further 20% feed in a sacrifice area.

Figure 43 Best description of feed out area



(KG2 Agdata Sales and Marketing 2019)

Figure 44 Location where hay and silage are fed – Murray Dairy farms

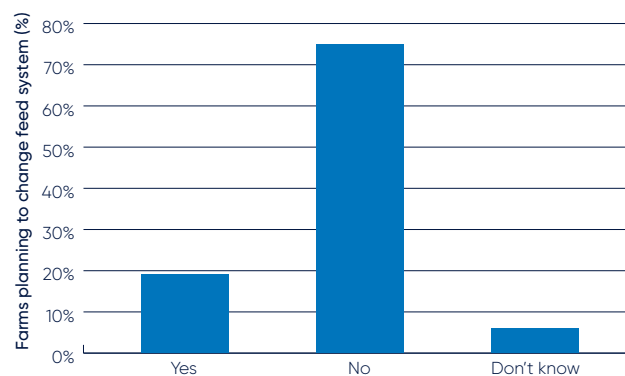


(Down To Earth Research and Dairy Australia 2020)

Planning to change feeding system

19% of Murray Dairy farmers indicated that they planned to change from their current feeding system within the next 5 years. Many farms have already changed their feeding system from what was predominantly a perennial pasture-based system.

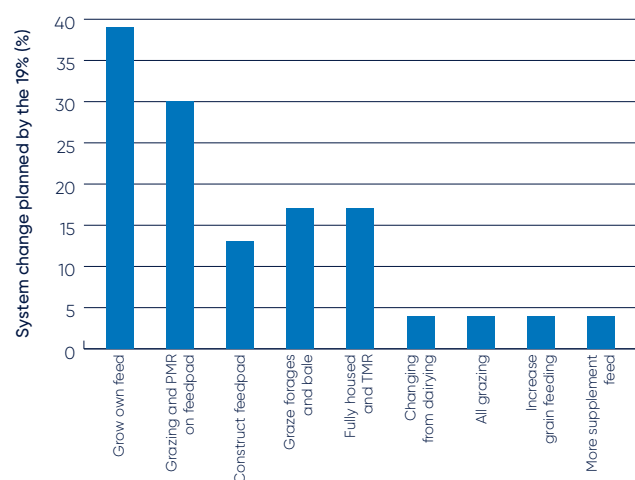
Figure 45 Murray Dairy farms planning to change feed system in next 5 years



(KG2 Agdata Sales and Marketing 2019)

Of the 19% planning to change, 39% are planning to grow their own feed, 30% are planning to move to a PMR system on a feedpad and 13% plan to construct a feedpad.

Figure 46 Planned system changes



(KG2 Agdata Sales and Marketing 2019)

Types of feeding equipment

22% of Murray Dairy farms have a mixer wagon

17% of Murray Dairy farms have a silage wagon (this may include some of those with a mixer wagon)

69% of Murray Dairy farms use a round bale feeder

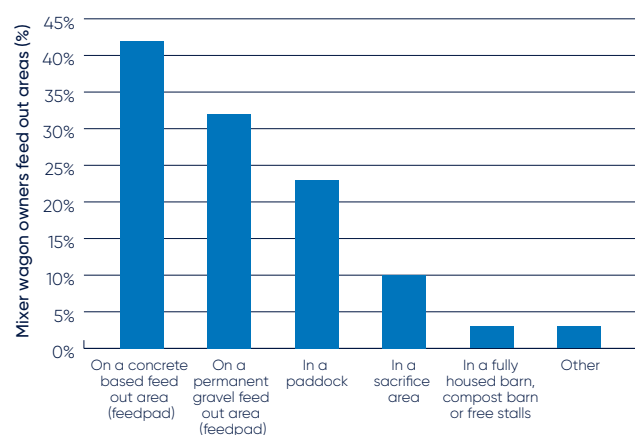
Mixer wagons

22% of the region use mixer wagons. Of these farms with mixer wagons, 74% utilise a feedpad to feed their ration. (42% concrete pads and 32% permanent gravel pads.)

23% of those with mixer wagons still feed in the paddock.

10% of those farms with mixer wagons also use a sacrifice paddock at some time of the year and 10% of farms with mixer wagons also graze for the full 12 months of the year.

Figure 47 Mixer wagon owners feed out areas

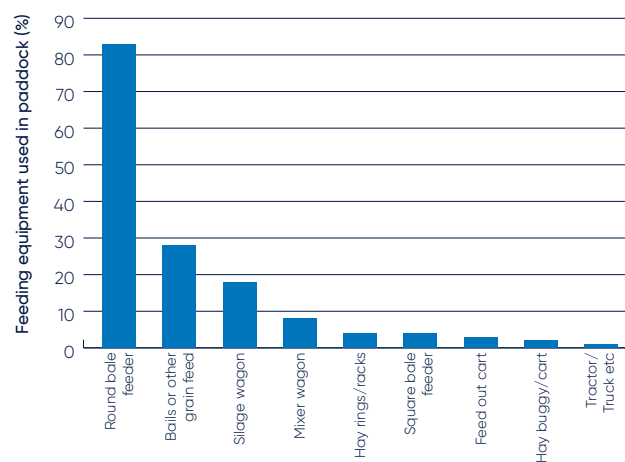


(Down To Earth Research and Dairy Australia 2020)

Round bale feeders

Round bale feeders are the equipment of choice for those farmers that fed in the paddock. 83% of those who fed hay or silage in the paddock used round bale feeders while 76% of those who fed hay or silage in sacrifice areas also used round bale feeders. 43% of farms that fed hay or silage on a feedpad also used round bale feeders, indicating that those farmers transitioning to a more intensive system with a feedpad (and in particular those in the early stages of transition with a gravel feedpad) also utilised a round bale feeder suggesting that they operated different systems (using the feedpad and feeding in the paddock) depending on the season, circumstances or feeding objectives.

Figure 48 Feeding equipment used by those that feed in the paddock



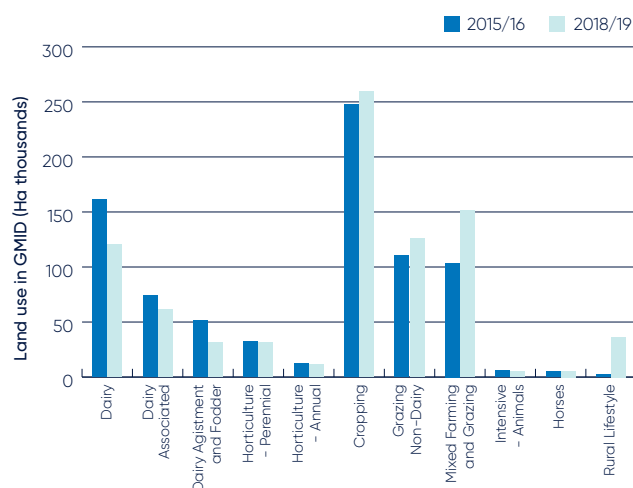
(KG2 Agdata Sales and Marketing 2019)

LAND AND WATER USE

In 2018/19 dairy in the GMID has seen a 25% reduction in irrigated area and a 31% reduction in irrigation water-use licences owned since 2015/16. Over the same period, there has also been a reduction in dairy associated (-16%) and dairy agistment and fodder (-39%) hectares altogether. Dairy agistment and fodder has also reduced in the area (-39%) and water-use licensed farms (-46%) over that time.

Figure 49 Change in land use in GMID 2015/16–2018/19

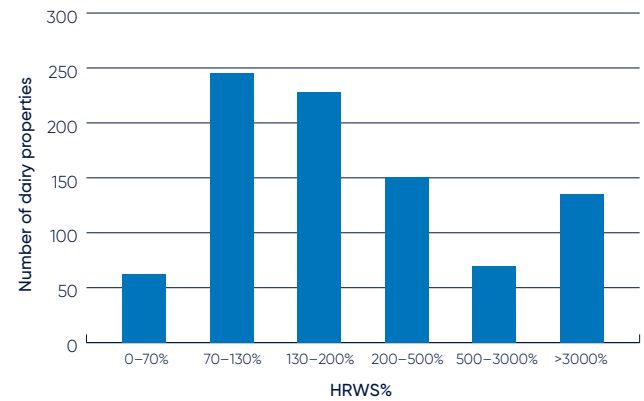
Land use in GMID	Area Ha 2015/16	Area Ha 2018/19
Dairy	160,984	120,178
Dairy Associated	73,829	61,750
Dairy Agistment and Fodder	51,467	31,212
Horticulture – Perennial	32,050	31,569
Horticulture – Annual	12,590	11,603
Cropping	247,465	259,566
Grazing Non-Dairy	110,329	126,260
Mixed Farming and Grazing	103,674	151,129
Intensive – Animals	6,092	4,852
Horses	4,736	5,521
Rural Lifestyle	26,777	36,370



Unpublished data Andy McAllister 2020

Dairy farms in the GMID used significantly more water than they owned as High Reliability Water Shares (HRWS) in 2017/18.

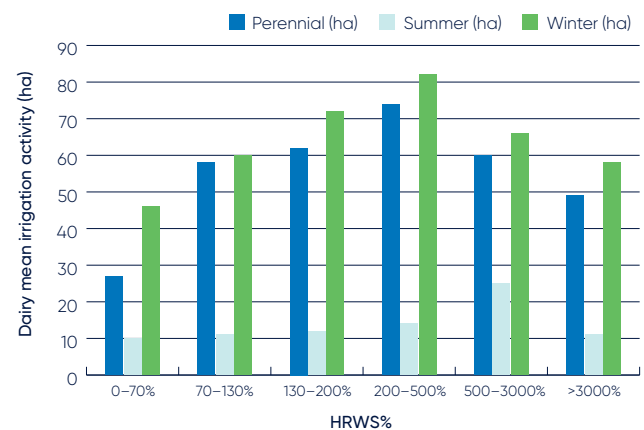
Figure 50 GMID dairy farms water use compared to HRWS%



(McAllister 2019)

GMID farmers are irrigating more winter species than perennial species. Much less summer species are being irrigated, compared to both winter and perennial species.

Figure 51 Species grown by dairy farms of varying water use in the GMID 2017/18



(McAllister 2019)

Irrigation systems

The most common irrigation delivery method across the GMID in 2015/16 was gravity irrigation channel. This remains the dominant delivery method in 2019.

Water use change

Water use across the GMID has seen a significant decline since 2001. The HRWS ownership remained relatively consistent between 2001/02 and 2007/08 then declined by 517GL less than the 2001/02 volumes. Water use was similar to water ownership until 2006/07 when the millennium drought saw allocations drop to 30–35% and water use decline. Water use has increased in more recent years highlighting the gap between ownership and use.

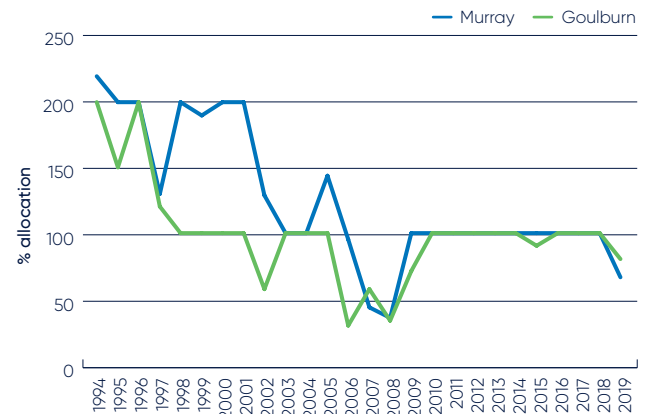
Figure 52 Water use change in the GMID and dairy industry

Year	GMID HRWS (GL)	GMID water use (GL)	Dairy HRWS (GL)	Dairy water use (GL)
2001/02	1597	2053	819	1065
2002/03	1598	1450		
2003/04	1567	1652	709	922
2004/05	1543	1534		
2005/06	1517	1739		
2006/07	1480	945		
2007/08	1585	769		
2008/09	1490	574		
2009/10	1365	774		
2010/11	1273	772		
2011/12	1103	1286		
2012/13	1068	1622	470	746
2013/14	1068	1295		
2014/15	1000	1456	465	740
2015/16	1000	1230	465	600
2016/17	1080	1312	350	585

(Goulburn Broken Catchment Management Authority 2017)

Water allocations

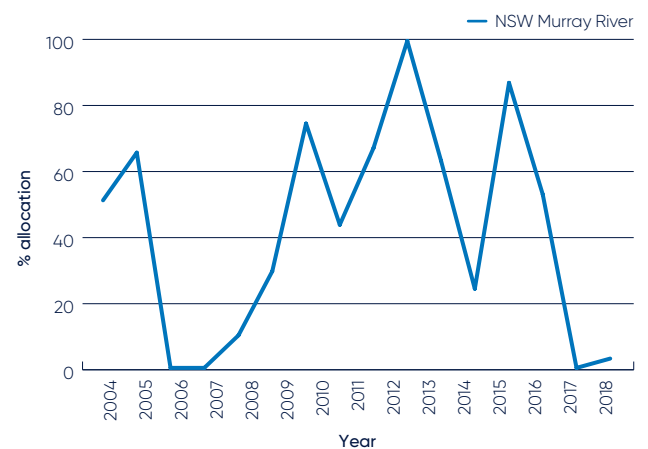
Figure 53 Victorian Goulburn and Murray water allocations 1994–2019



(Goulburn Murray Water 2020)

(Goulburn Broken Catchment Management Authority 2017)

Figure 54 NSW Murray River general security water allocations 2004–2019



(NSW Department of Planning Industry and Environment 2020)

- 2019 Total dairy enterprises – 704
- Water use change 2016 ~ 490 GL to 2019 ~420 GL
- Total GMID water use is similar in both years (~1100 GL), much of the water use has been picked up by cropping/ grazing non-dairy and mixed farming
- Dairy as a sector still the biggest water user

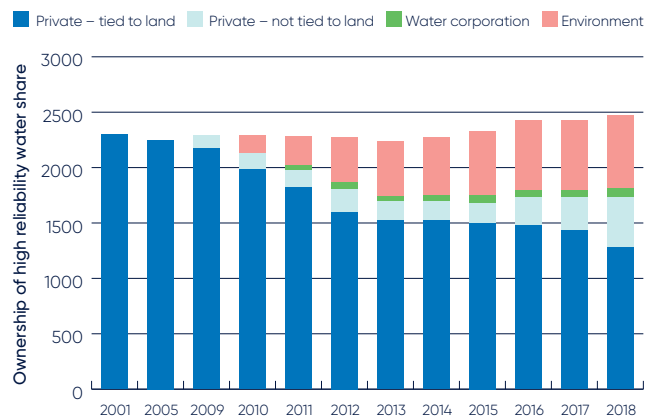
Andy McAllister unpublished data

Carryover water has been used as a management tool to reduce volatility risk.

High variation in water allocations depending on seasonal conditions. Volatility in price of temporary water.

Water ownership

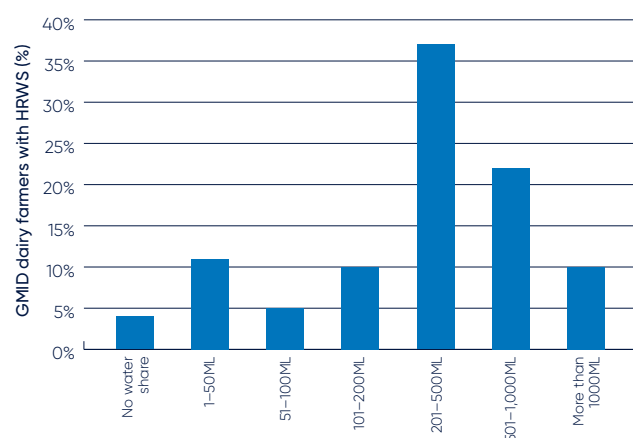
Figure 55 Ownership of high reliability water share



(Victorian Farmers Federation 2018)

Based on a survey of 121 GMID dairy farmers by GBCMA in 2017, only 4.1% of dairy farmers have no HRWS. 69% own more than 200 ML.

Figure 56 GMID dairy farmers with HRWS 2017

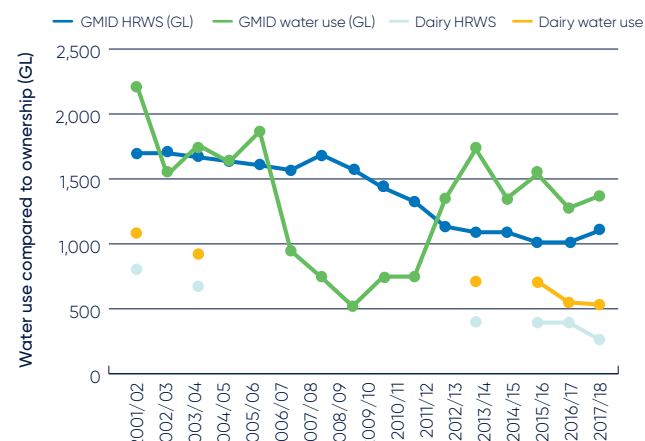


(Goulburn Broken Catchment Management Authority 2017)

Water use

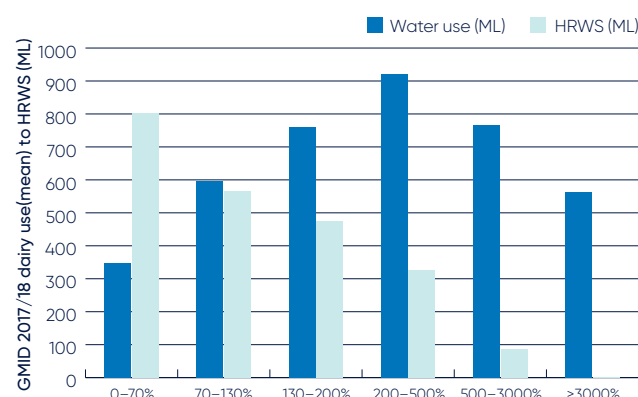
In 2017/18 the dairy industry in the GMID used 55% less water (585 GL) compared to 2001/02 (1065 GL).

Figure 57 GMID and Dairy HRWS ownership vs water use

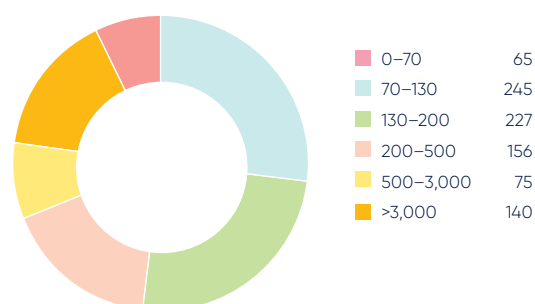


(McAllister 2019)

Figure 58 GMID dairy water use compared to HRWS ownership



Proportion of farmers in each category



(Department of Environment Land Water and Planning 2019)



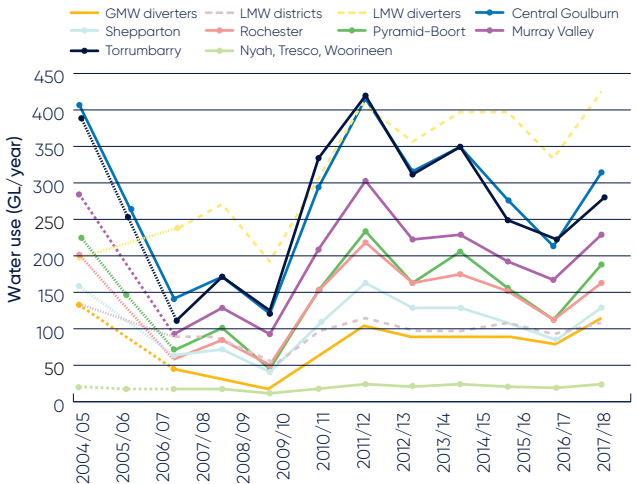
Lower Murray Water (LMW) diverters have greatly increased water use and are placing significant upward pressure on temporary water prices.

Figure 59 Water use, GMID and LMW districts and diverters 2004/05 compared to 2017/18

Year	2004/05		2017/18	
	HRWS	Use	HRWS	Use
GMW District	1,580	1686	887	1,318
GMW Diverters	241	133	159	96
LMW District	179	136	111	104
LMW Diverters	252	196	209	431
Total	2,252	2,151	1,366	1,949

(Victorian Farmers Federation 2018)

Figure 60 Trends in water use 2008-2018



(Mitchell 2019)

GLOSSARY OF TERMS

Total mixed ration (TMR)

A TMR is a way to feed the cows by combining all forages, grains, protein feeds, minerals, vitamins and feed additives formulated to a specified nutrient concentration into a single mix feed.

Partial mixed ration (PMR)

A PMR is when a mixed ration is used in conjunction with other feed inputs such as grazing, hay, silage, or grain. Unlike TMR the PMR mixed ration does not combine all the feeds in a single mix.

Total component-fed ration (TCR)

TCR describes a feeding system where stock are fully fed with supplementary fodder such as hay, grain, silage, and other feed additives without access to grazing other plant material. This is fed as a combination of separate feeds fed at different times of the day and not a combined ration mixed in a mixer wagon.

Home grown feed

This is fodder or grain that is grown on the farm or support land and either grazed or stored as hay, silage or grain to be fed back to the herd at a later date.

Water-use licence

A water-use licence is an entitlement to irrigate a specific parcel or parcels of land. The licence sets out the conditions for use, such as how much water can be used in a single irrigation season.

A water-use licence is required if the farm is supplied with water for irrigation from the regulated Murray, Goulburn, Broken, Loddon or Campaspe systems.

The licence is tied to the land. If the property is sold, the water-use licence automatically transfers to the new owner, unless part of the property is sold separately.

List of abbreviations

TMR: Total Mixed Ration

PMR: Partial Mixed Ration

TCR: Total Component-fed Ration

RoTA: Return on Total Assets

GMID: Goulburn Murray Irrigation District

LMW: Lower Murray Water

GBCMA: Goulburn Broken Catchment Management Authority

HRWS: High-reliability water share

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