

Australian Dairy Herd Improvement Report 2023



DataGene is an independent and industry-owned organisation responsible for driving genetic gain and herd improvement in the Australian dairy industry and is an initiative of Dairy Australia and industry.



AGRI-GENE



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Introduction

This herd improvement report has been compiled from detailed production records collected from about 2.5 million test days during 2022/2023. When combined with DataGene's historical genetic evaluation dataset, the information provides a unique, long-term view of the national dairy herd.

DataGene is grateful for support from its member organisations and farmers in delivering the data used in this report. It wouldn't be possible without the herd test data (supplied by HICO, National Herd Development, TasHerd, Dairy Express, Farm West, Nu Genes, Yarram Herd Services and Australian Herd Recording Services), data from on-farm software and type data supplied by breed associations.

Statistics

The practice of herd recording delivers reliable information for on-farm decision making. Every year, this data is compiled and published to facilitate a broader analysis of herd, production and genetic trends. Tables 1-10 describe production trends by age, breed, mating type and region. As some data in this report dates back to the 1930s, you will find a rich resource describing Australia's changing herd. A more detailed statistics file and information from previous years are available at www.datagene.com.au/

Note: 2022/2023 data was extracted several months earlier than its preceding years.



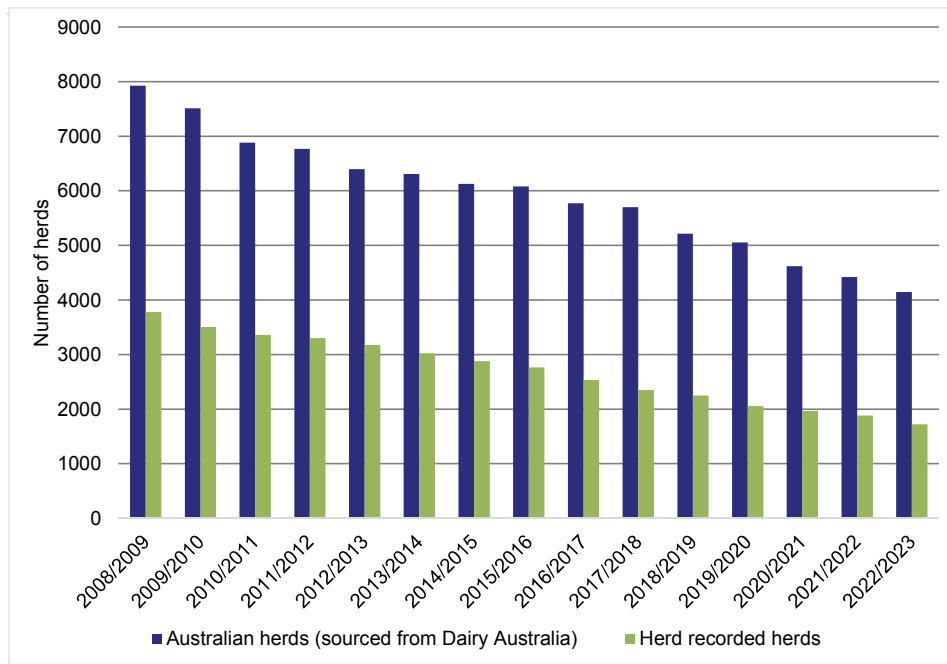
Table 1 : National and state totals and production averages

State	Herds and cows recorded				Production averages						
	Number of herds	Included in averages	Excluded from averages	Total cows	Herd size	Milk (litres)	Fat (%)	Fat (kg)	Protein (%)	Protein (kg)	Lactation length (days)
Victoria	1,120	87,744	200,813	288,557	257.6	6,895	4.1	286	3.4	232	319
New South Wales	220	25,706	32,164	57,870	263	7,317	4.0	296	3.3	243	324
Queensland	108	6,833	9,604	16,437	152.2	5,826	4.1	238	3.3	191	317
South Australia	120	15,176	16,634	31,810	265.1	7,838	4.1	319	3.3	258	331
Tasmania	87	4,295	24,833	29,128	334.8	6,521	4.2	271	3.4	221	309
Western Australia	67	12,099	8,219	20,318	303.3	7,808	3.9	303	3.2	249	334
Australia	1,722	151,853	292,267	444,120	257.9	7,075	4.1	290	3.3	235	322
Victorian regions											
Northern	402	35,455	63,357	98,812	246	7,293	4	298	3	242	323
Eastern	441	27,685	85,188	112,873	256	6,575	4	270	3	221	321
Western	277	24,604	52,268	76,872	278	6,683	4	286	3	228	311

Table 2 : National totals and production averages 1999 to 2023

Year	Herds and cows recorded				Production averages						
	Herd recorded herds	Included in averages	Excluded from averages	Total cows	Herd size	Milk (litres)	Fat (%)	Fat (kg)	Protein (%)	Protein (kg)	Lactation length (days)
1999/2000	6,976	947,104	81,129	1,028,233	147.4	5,691	4	230	3.3	187	302
2000/2001	7,405	940,712	286,248	1,226,960	165.7	5,682	4	229	3.3	186	302
2001/2002	6,930	888,497	303,269	1,191,766	172.0	6,027	4	243	3.3	200	307
2002/2003	6,358	842,113	335,786	1,177,899	185.3	5,877	4	235	3.3	193	303
2003/2004	5,704	722,074	298,727	1,020,801	179.0	6,048	4.0	242	3.3	201	310
2004/2005	5,080	725,374	224,352	949,726	187.0	6,257	4.0	251	3.3	207	314
2005/2006	4,746	701,852	208,536	910,388	191.8	6,402	4.0	255	3.3	212	316
2006/2007	4,462	655,212	222,592	877,804	196.7	6,452	4.0	257	3.3	216	312
2007/2008	3,966	578,263	207,199	785,462	198.0	6,596	4.0	264	3.3	220	321
2008/2009	3,779	566,029	206,694	772,723	204.5	6,645	4.1	270	3.4	223	318
2009/2010	3,503	522,869	201,400	724,269	206.8	6,680	4.0	270	3.3	223	323
2010/2011	3,359	518,675	186,915	705,590	210.1	6,813	4.0	273	3.3	228	323
2011/2012	3,301	525,908	205,174	731,082	221.5	6,930	4.0	274	3.3	231	324
2012/2013	3,173	511,923	195,896	707,819	223.1	6,881	4.0	272	3.3	229	322
2013/2014	3,023	492,461	180,638	673,099	222.7	6,890	4.0	273	3.3	228	327
2014/2015	2,880	493,582	186,955	680,537	236.3	6,979	4.0	278	3.3	232	324
2015/2016	2,764	472,223	194,462	666,685	241.2	6,983	4.0	279	3.3	233	320
2016/2017	2,532	391,908	206,182	598,090	236.2	6,861	4.0	274	3.3	227	324
2017/2018	2,351	404,116	185,378	589,494	250.7	6,912	4.0	276	3.3	231	321
2018/2019	2,248	392,750	204,607	597,357	265.7	6,870	4.0	275	3.3	229	320
2019/2020	2,056	354,915	185,076	539,991	262.6	7,041	4.0	282	3.3	236	324
2020/2021	1,967	344,157	183,396	527,553	268.2	7,085	4.1	290	3.4	238	323
2021/2022	1,882	319,973	186,734	506,707	269.2	7,069	4.1	290	3.3	237	321
2022/2023	1,722	151,853	292,267	444,120	257.9	7,075	4.1	290	3.3	235	322

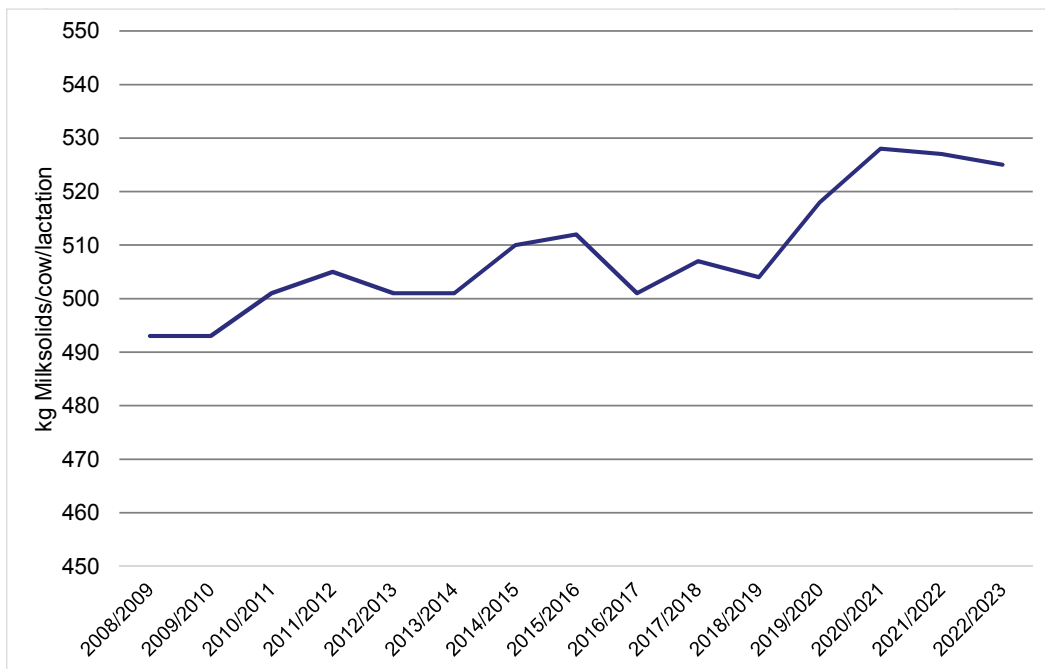
Figure 1: Number of Australian dairy herds and herd recorded herds 2008-2023



Data sources

Forty-two per cent of Australian herds contribute to a rich and important dataset of high-quality herd recording data. As trends in data capture change on farm, it is critical that our industry grows its capacity to tap into a range of common data sources for the benefit of farmers, research and industry development activities. DataGene’s Data Connect project is just one example of active projects that are focused on this objective.

Figure 2: Average milk solid yield/cow/lactation 2008-2023



Per cow production grows

The most recent average milk solid yield was 525 kg milk solids per cow per lactation. After a decade of little growth, production has lifted by 4% in the most recent four years. Dairy Australia’s InCalf book for dairy farmers uses the ratio between the yield of mature cows compared to 2 year olds and suggests that 0.85 is an indicator of adequate heifer growth. Last year, the ratio was 0.87.

Table 3: Number of herds in fat production categories by region

State	Total Herds	Average Fat Production (kg per cow)									
		<125	125-149	150-174	175-199	200-224	225-249	250-274	275-299	300-324	>324
Victoria	1,120	42	40	36	54	92	110	149	151	107	121
New South Wales	220	3	0	6	14	22	28	33	28	16	35
Queensland	108	5	3	8	6	14	14	4	9	2	7
South Australia	120	8	1	1	2	6	8	12	18	18	35
Tasmania	87	5	4	8	4	2	1	7	11	7	4
Western Australia	67	0	1	1	0	6	2	11	8	15	18
Australia	1,722	63	49	60	80	142	163	216	225	165	220
Victorian regions											
Northern	402	11	10	13	16	21	35	48	58	52	68
Eastern	441	18	15	16	26	38	50	64	56	35	27
Western	277	13	15	7	12	33	25	37	37	20	26

Table 4: Number of herds in protein production categories by region

State	Total Herds	Average Protein Production (kg per cow)									
		< 100	100-124	125-149	150-174	175-199	200-224	225-249	250-274	275-299	> 299
Victoria	1,120	39	53	45	101	126	185	160	124	45	24
New South Wales	220	3	1	10	21	35	32	34	32	12	5
Queensland	108	4	4	9	11	22	7	8	3	2	2
South Australia	120	6	3	1	9	12	16	15	21	10	16
Tasmania	87	5	6	4	7	5	7	7	9	1	2
Western Australia	67	0	1	1	4	4	11	13	13	11	4
Australia	1,722	57	68	70	153	204	258	237	202	81	53
Victorian regions											
Northern	402	10	15	13	28	34	62	64	66	27	13
Eastern	441	16	22	22	41	54	77	65	31	11	6
Western	277	13	16	10	32	38	46	31	27	7	5

Table 5: Production averages by age group

Age Group	Number of cows	Production Averages						
		Milk (litres)	Fat (%)	Fat (kg)	Protein (%)	Protein (kg)	Lactation length (days)	Total 1milksolids
2 Year Old	25,271	6,327	4.09	259	3.33	211	325	470
3 Year Old	27,274	7,000	4.1	287	3.37	236	326	523
Mature Cow	99,308	7,286	4.1	299	3.32	242	320	541
Total	151,853	7,075	4.1	290	3.33	235	322	525

Figure 3: Production average of 2 year olds and mature cows

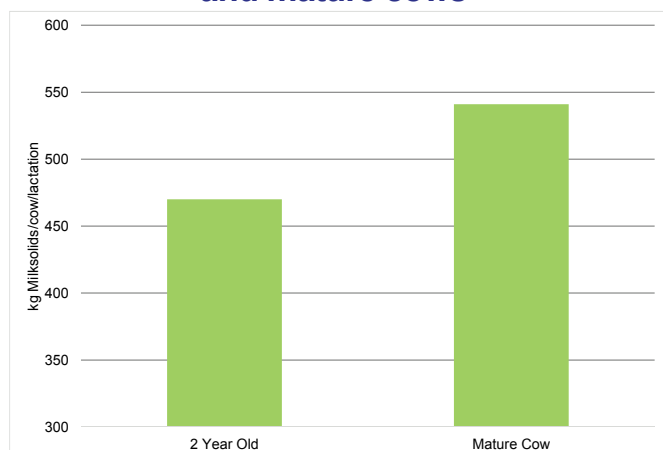


Table 6: Production averages by age group and mating type

Age Group	Number of Cows	Average Fat (kg)		Average Protein (kg)	
		Artificially Bred Stock	Naturally Bred Stock	Artificially Bred Stock	Naturally Bred Stock
2 Year Old	25,271	265	238	216	193
3 Year Old	27,274	299	257	246	211
Mature Cow	99,308	316	277	256	223
Total	151,853	302	270	246	218

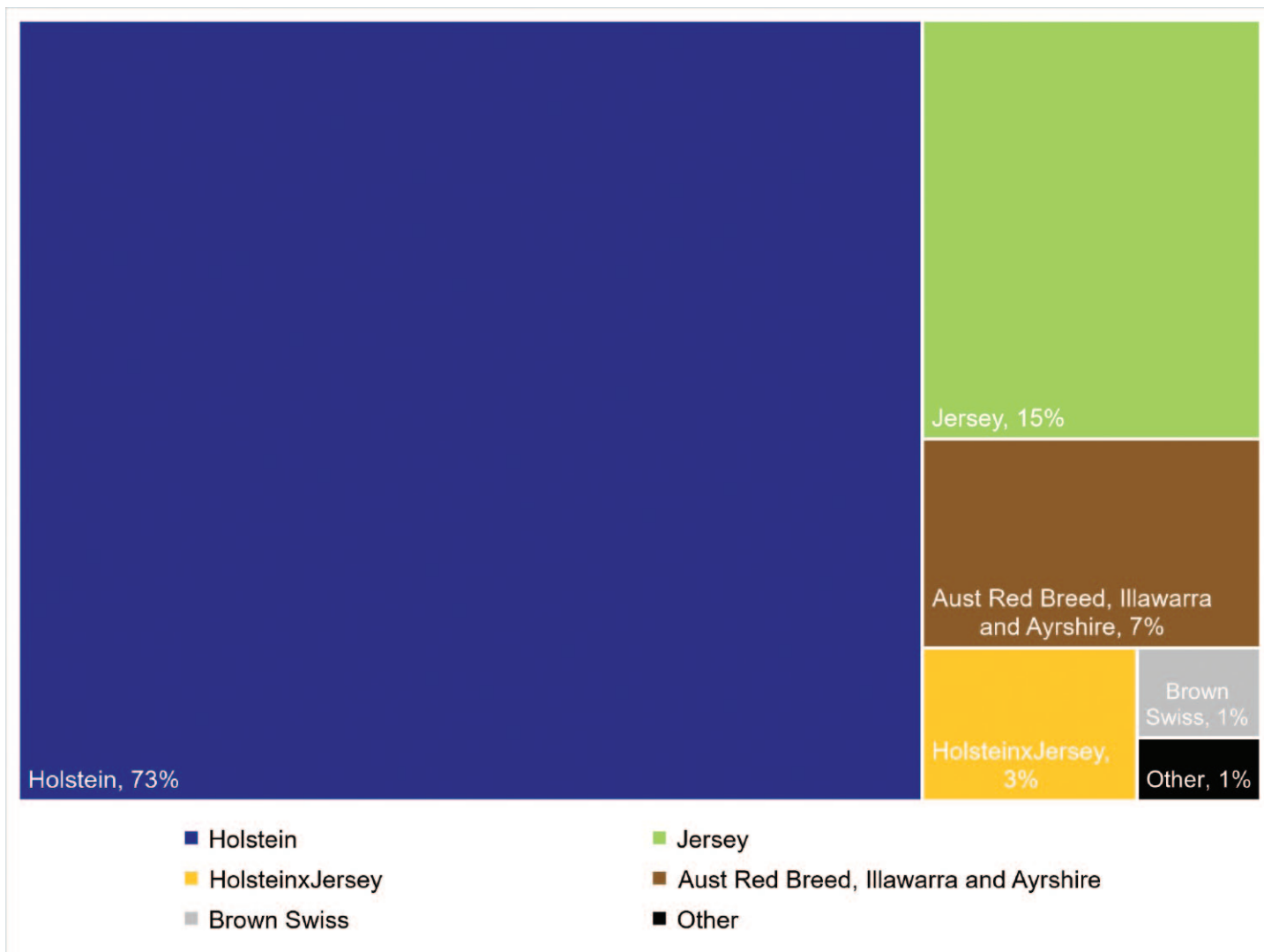
Table 7: Production averages by month of calving

Month of Calving	Number of Cows	% of Total	Production Averages				Lactation Length (days)	
			Milk (litres)	Fat (%)	Fat (kg)	Protein (%)		Protein (kg)
January	9,203	6.1	7,364	4.06	299	3.32	244	335
February	17,890	11.8	7,383	4.09	302	3.35	247	324
March	31,889	21	7,134	4.12	294	3.37	240	310
April	22,761	15	7,049	4.09	289	3.35	236	293
May	8,111	5.3	6,450	4.09	264	3.36	216	266
June	2,313	1.5	5,185	4.07	211	3.33	173	221
July	1,720	1.1	4,274	4.02	172	3.30	141	185
August	3,781	2.5	5,370	4.06	218	3.30	177	255
September	23,716	15.6	7,229	4.14	299	3.32	240	365
October	14,519	9.6	7,205	4.10	296	3.28	236	358
November	8,896	5.9	7,434	4.04	301	3.24	241	356
December	7,054	4.6	7,429	4.07	302	3.25	242	349
Australia	151,853	100	7,075	4.10	290	3.33	235	322

Table 8: Production averages by breed

Breed	Number of Cows	Production Averages				Lactation Length (days)	
		Milk (litres)	Fat (%)	Fat (kg)	Protein (%)		Protein (kg)
Holstein	89,123	7,643	3.97	303	3.25	249	324
Jersey	17,923	5,583	4.87	272	3.71	207	317
Holstein/Jersey Cross	4,150	6,303	4.37	275	3.46	218	313
Guernsey	595	5,680	4.43	252	3.41	194	333
Ayrshire	1,041	5,858	4.10	240	3.29	193	332
Dairy Shorthorn	113	6,152	3.78	233	3.24	199	294
Illawarra	2,452	6,632	4.14	274	3.28	218	326
Unknown Breed	29,344	6,575	4.11	270	3.34	219	318
Simmental	357	7,809	4.06	317	3.35	262	309
Red Poll	17	5,646	3.76	212	3.09	174	317
Meuse-Rhine-Issel	5	6,114	4.41	270	3.42	209	307
Aust Milking Zebu	1	5,453	4.90	267	3.69	201	359
Commercial Dairy	1	3,451	5.51	190	3.80	131	357
Aust Red Breed	5,320	6,628	4.14	274	3.45	228	316
Sahiwal	0	0	0	0	0	0	0
Brown Swiss	1,404	6,672	4.04	269	3.46	231	332
Aust Friesian Sahiwal	7	6,456	4.29	277	3.37	218	309
Total	151853	7075	4.10	290	3.33	235	322

Figure 4: Proportion of animals of known breed



National breed composition

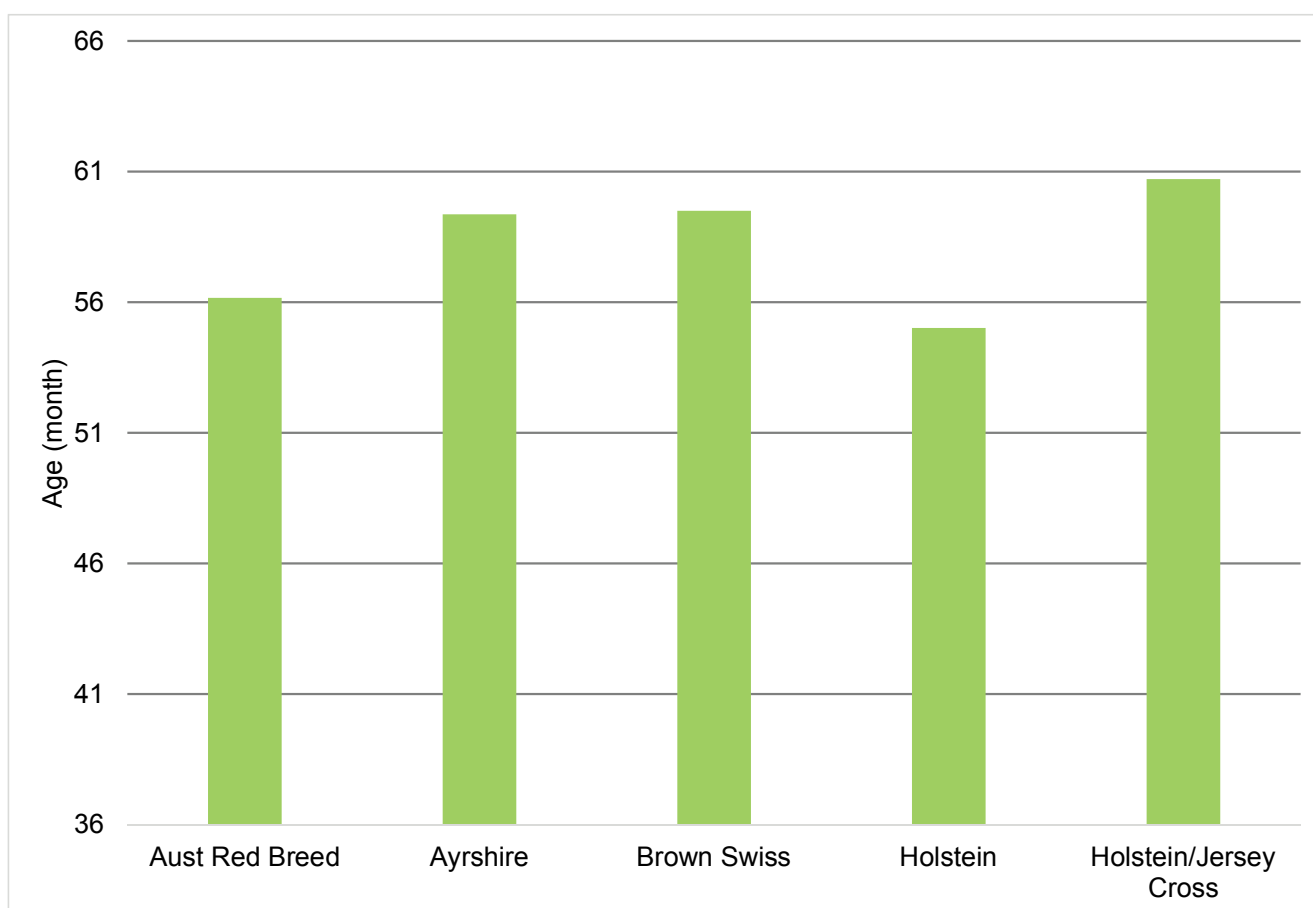
The question of favourite breed stands up against tractor brand as one of the most hotly contested debates amongst farmers. So it's not surprising that the breed make-up of the national herd is a popular table. Figure 4 shows the proportion of each breed in this dataset. There has been a small shift in breed towards Jersey (up 2%) and the Red Breed Group (up 2%) at the expense of Holstein/Jersey cross and Holstein, over the last 10 years.



Table 9: Distribution of calvings by month and region

State	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Victoria	3	10	25	18	6	2	1	3	17	9	3	2
New South Wales	10	15	16	11	5	1	1	1	11	11	10	8
Queensland	12	13	14	12	6	2	1	1	9	9	9	10
South Australia	9	16	17	10	4	1	1	2	14	11	8	7
Tasmania	1	2	14	6	2	0	0	5	47	19	4	1
Western Australia	13	18	15	10	4	1	1	1	10	7	12	9
Australia	6	12	21	15	5	2	1	2	16	10	6	5
Victorian regions												
Northern	3	7	26	21	5	1	1	3	18	10	4	3
Eastern	1	10	27	15	4	1	2	4	21	10	2	1
Western	6	14	21	19	10	3	1	2	12	6	2	3

Figure 5: Average at most recent calving



Average age of Australian dairy cows

Farmers spend significant time and financial resources in rearing high quality replacement heifers, so it is unsurprising that we love long-lasting cows. Longer lifespans are great for animal welfare, reduce the intensity of methane emissions from a dairy farm and contribute to profitability through greater returns from more mature animals and lower replacement costs. The average age at a cow's most recent calving was 55.4 months (roughly 4½ years old) in herd-recorded cows. This is a way of describing the average age of cows in Australia. Figure 5 shows that the average age varies a little between breeds. The larger breeds (with at least 1000 cows) range between 55 and 61 months of age at their most recent calving.

Figure 6: Age at first calving

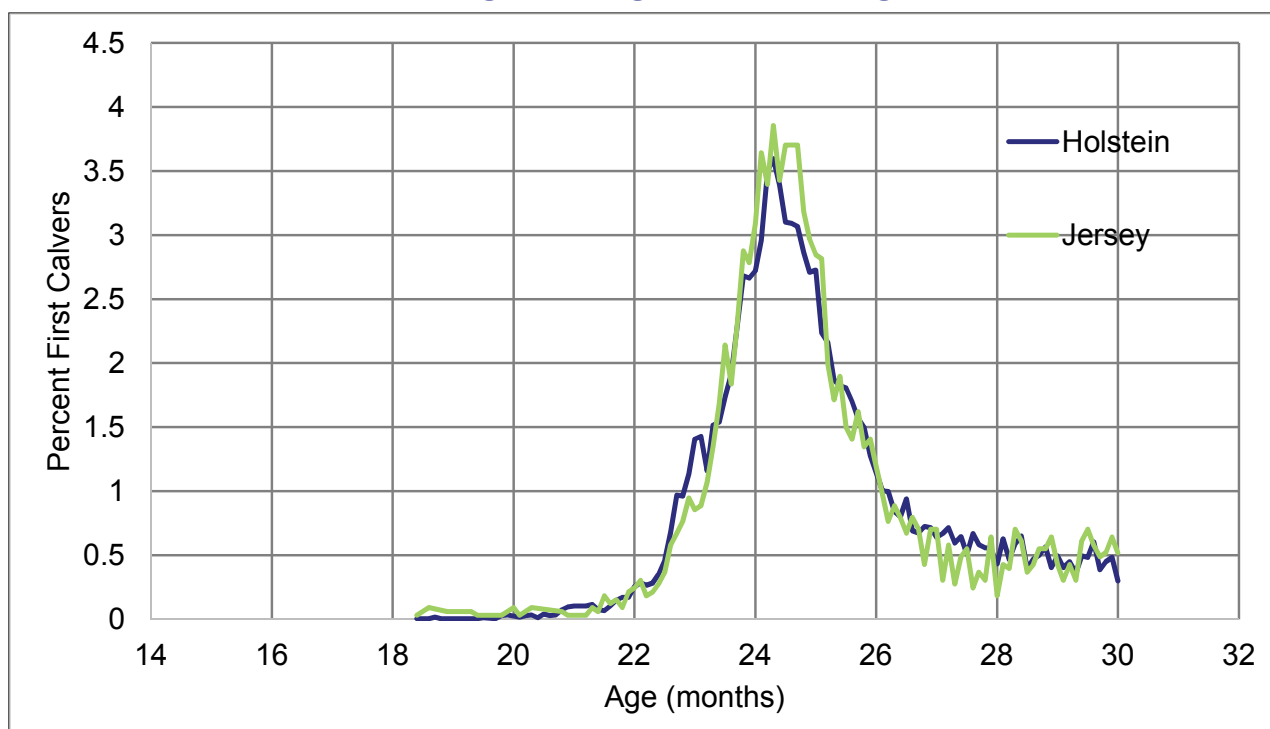
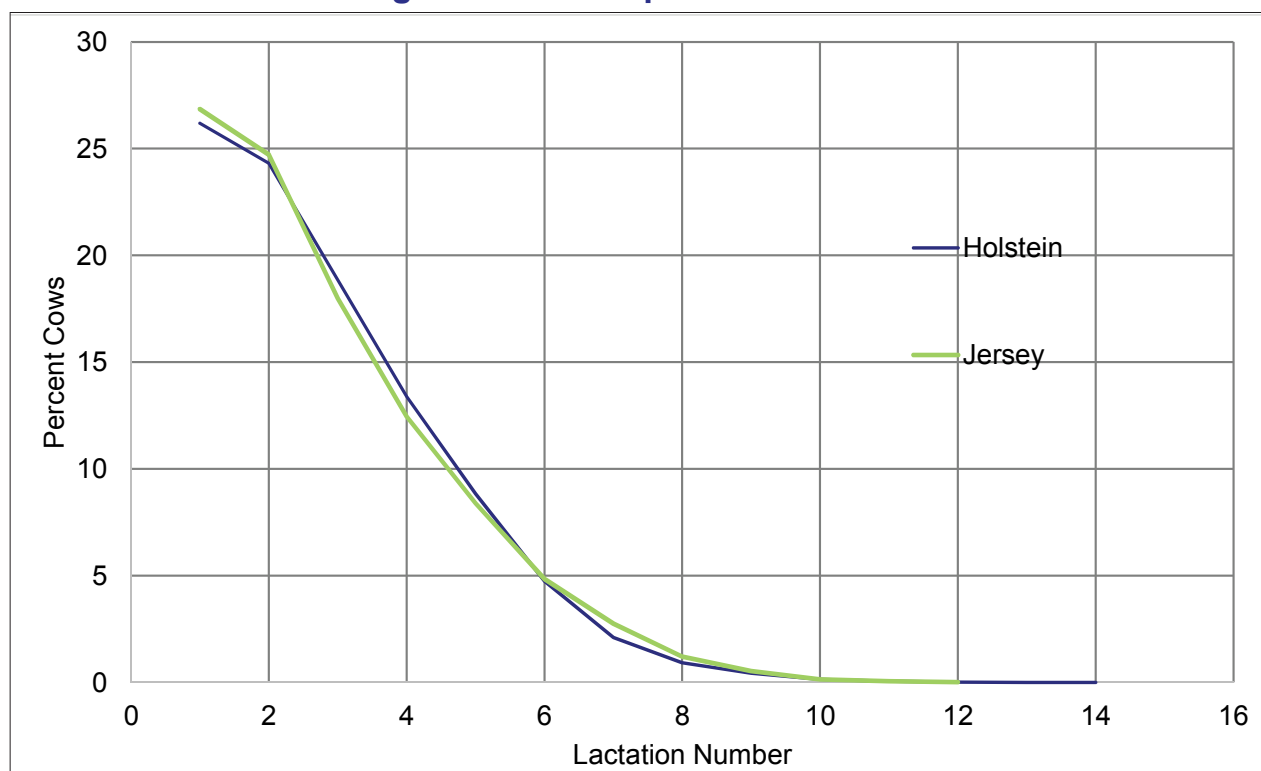


Figure 7: Animals per lactation number



Replacement rates

At herd level, farmers will often use replacement rate as a way of describing turn-over within the herd. Using herd-recording data, we can estimate a national herd replacement rate from the proportion of first lactation heifers entering the herd. For both Holstein and Jersey, the replacement rate was 26% as shown in Figure 7. Compared to a decade ago, this is 1-2% lower. From this same figure, we also observed that 17% of cows achieved at least five lactations which is a pleasing result. In both breeds, the culling rate is highest amongst cows in their third and fourth lactation. Research by DairyBio and DairyUp are targeting opportunities to improve herd longevity that will contribute to improved sustainability.

Figure 8: Proportion of cows by termination reason

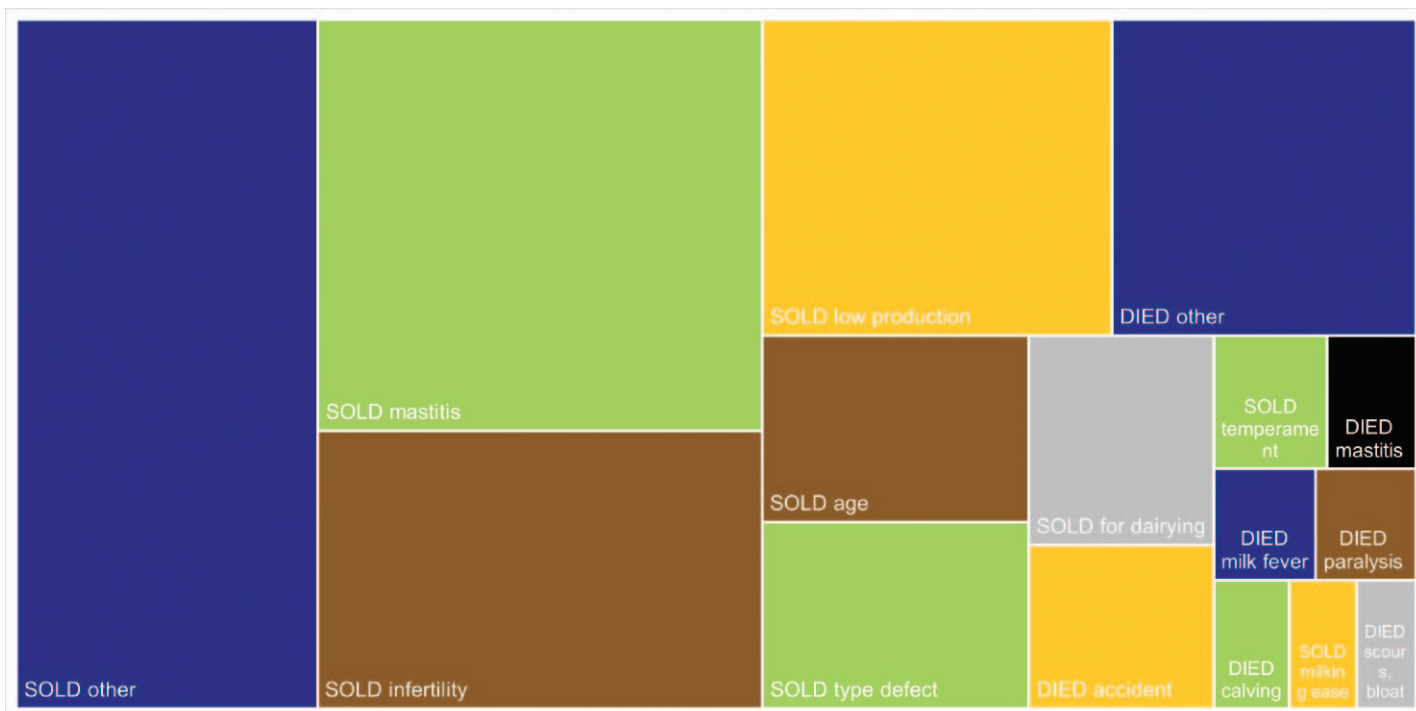


Table 10 : Proportion of cows by termination reason

REASON	% Cows
SOLD - other	22%
SOLD - mastitis	19%
SOLD - infertility	13%
SOLD - low production	11%
DIED - other	10%
SOLD - age	5%
SOLD - type defect	5%
SOLD - for dairying	4%
DIED - accident	3%
SOLD - poor temperament	2%
DIED - mastitis	1%
DIED - milk fever	1%
DIED - paralysis	1%
DIED - calving difficulties	1%
SOLD - ease of milking	1%
DIED - EBL, Johnes disease, scours, bloat	1%

Reasons for leaving

Why do cows leave the herd? Farmers routinely report when cows leave the herd and the reasons for their departure. Most of the cows that leave the herd are sold (82%), rather than die on farm. Interestingly, 'other' is the most common reason why cows are sold and why they died. This catch-all category is followed by mastitis, infertility and low production as the next three common reasons why cows were sold. Of the cows that die, accident and calving-related issues such as milk fever, paralysis and calving difficulties were the most frequent reasons.



Figure 9: Genetic trend Balanced Performance Index (BPI), Holstein

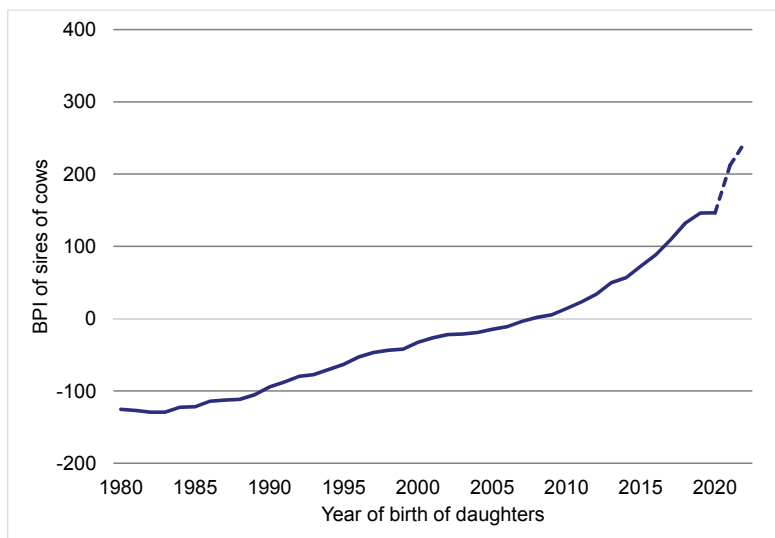


Figure 10: Genetic trend Health Weighted Index (HWI), Holstein

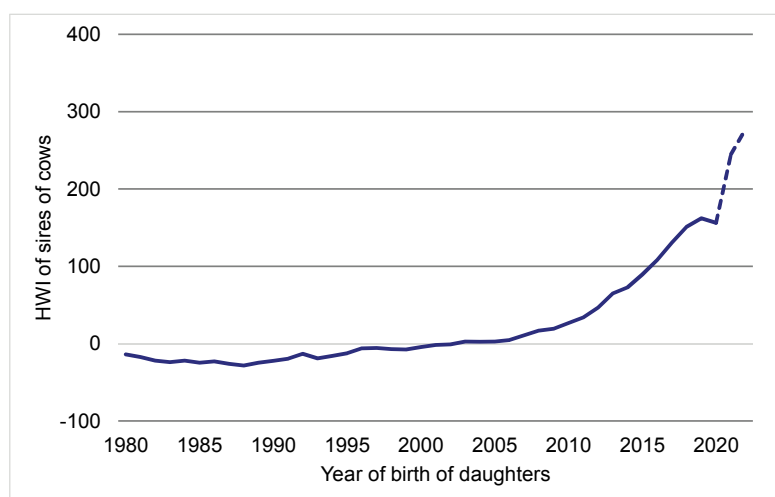


Figure 11: Genetic trend Sustainability Index (SI), Holstein

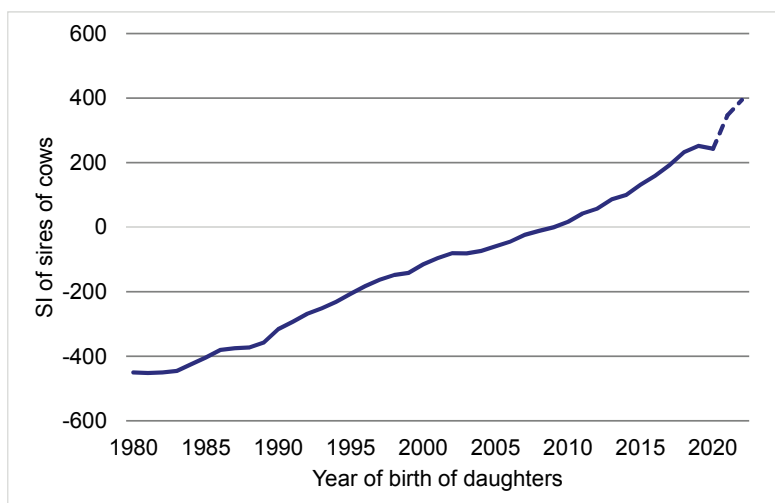
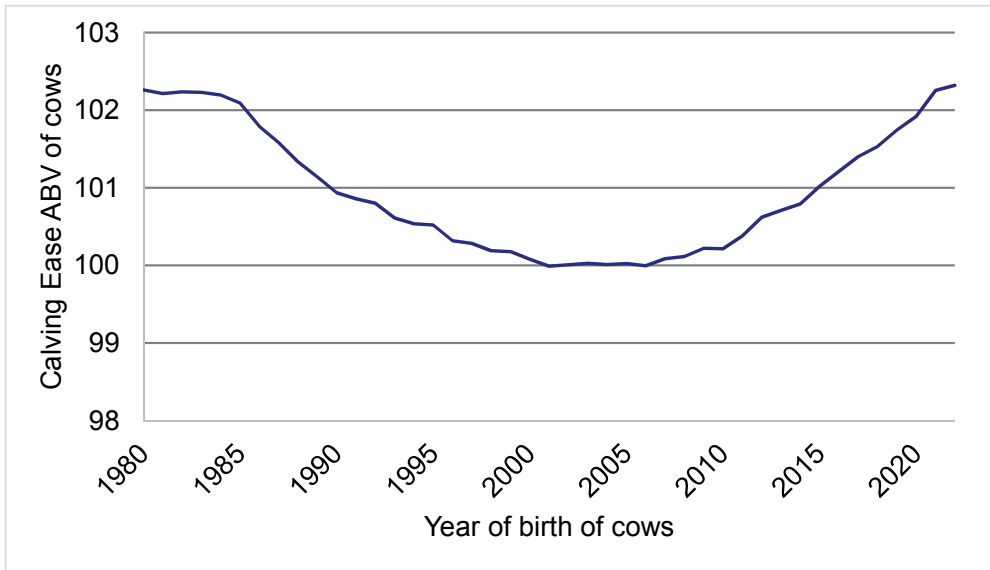


Figure 12: Genetic trend Calving Ease, Holstein

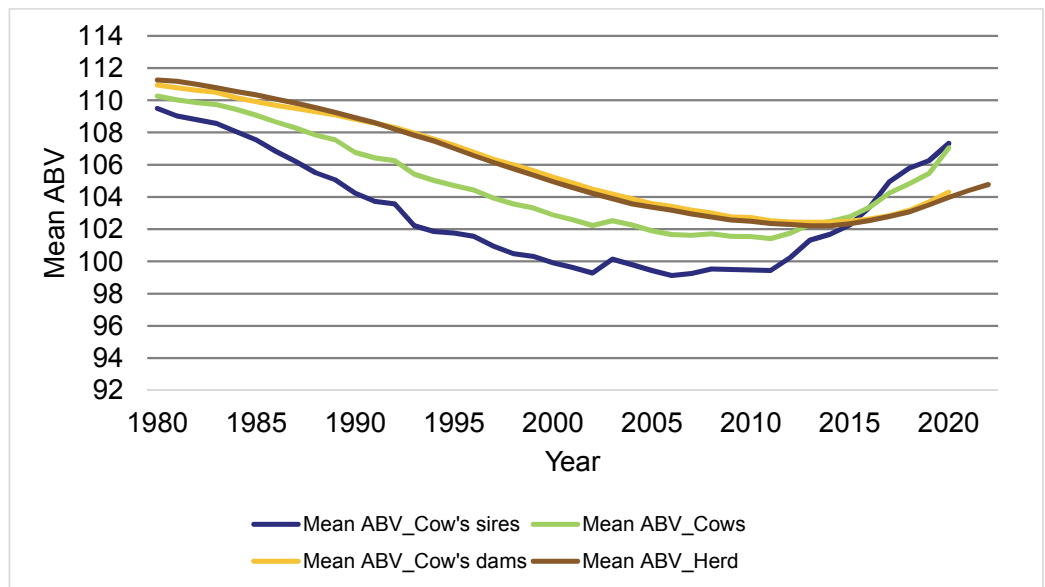


Calving ease steadily improves

Farmers who herd-record also routinely report calving events that include calf size, calf fate and calving ease. This information is used for genetic evaluations of sires for calving ease. The genetic trend for calving ease could be considered a quiet achiever as it has steadily improved without much fanfare. Improvement isn't accidental but rather the direct result of research by DairyBio that improved the evaluation, delivery by DataGene, use by bull companies to breed better bulls and pressure from farmers who selected for this trait.

Figure 13: Genetic trend for Daughter Fertility ABV, Holstein cows, sires, dams and herds

Mean daughter fertility ABVs for cows, cows' sires and cows' dams by cows' year of birth and mean daughter fertility ABVs for all calvings by year of calving.



Holstein fertility gains

Breeding a good herd of cows takes both time and diligence. Every selection decision matters. In a recent publication, Dr John Morton revealed the impact of annual decisions on the long-term genetic improvement for cow fertility. Figure 13 shows the genetic trend for Daughter Fertility ABV in sires, cows, the dams of cows and herds. There has been significant improvement in the genetic merit of sires for Daughter Fertility in Holsteins (blue line). However, it takes time for the superior animals to have an impact on the whole herd which is why herd average Daughter Fertility ABV (green dashed line) is rising but at a slower rate of gain. Making good sire selections each year, selecting the right replacement heifers and choosing the best dams to produce the next generation of heifers are all important to increasing the rate of genetic gain.

(<https://www.publish.csiro.au/an/pdf/AN23002>)

Figure 14: Genetic trend Balanced Performance Index (BPI), Jersey

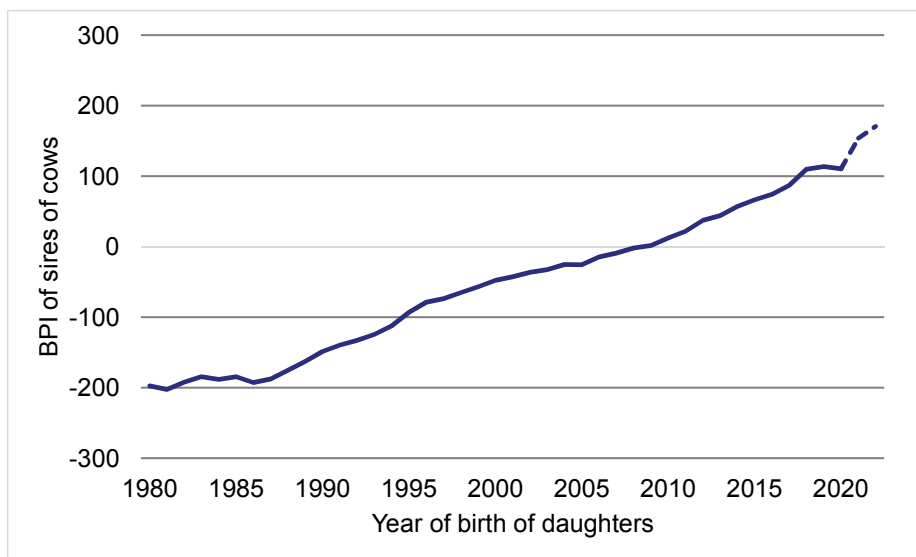


Figure 15: Genetic trend Health Weighted Index (HWI), Jersey

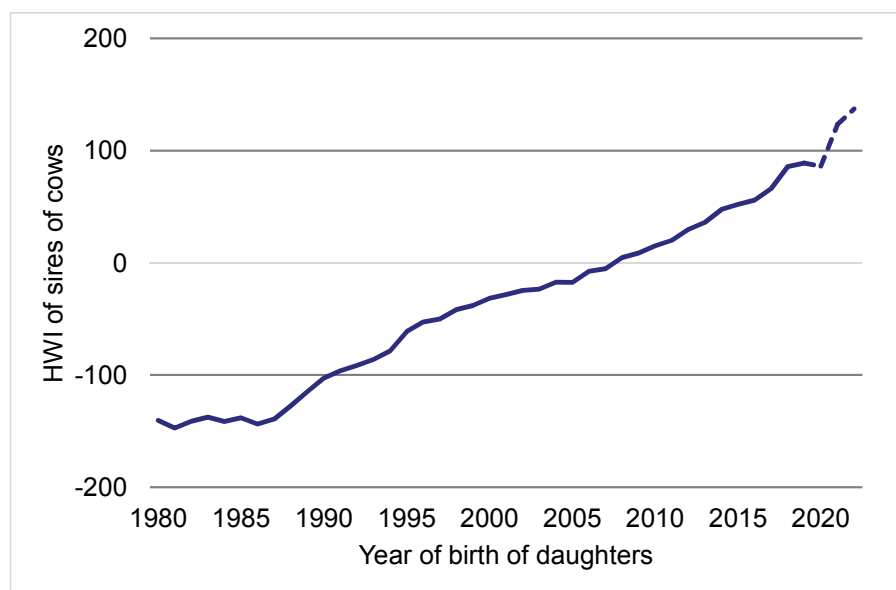
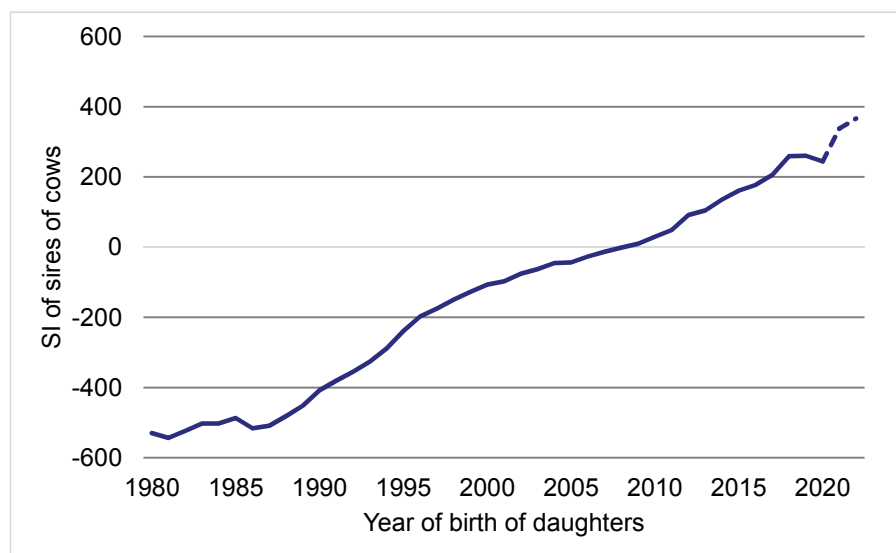


Figure 16: Genetic trend Sustainability Index (SI), Jersey



DataGene acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples.



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