

*New Zealand  
Dairy Statistics  
2021-22*



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# Contents

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<b>1. Introduction</b>	<b>4</b>
Introduction	4
Executive summary	5
<b>2. National dairy statistics</b>	<b>7</b>
A. Industry statistics	7
i) Production	7
ii) Population	8
B. Herd production statistics	10
i) Production per cow and per hectare	11
ii) Herd size distribution	13
<b>3. Regional dairy statistics</b>	<b>15</b>
A. Regions	15
B. Districts	18
C. Operating structures	22
D. Breed breakdown	26
<b>4. Herd improvement</b>	<b>27</b>
A. Use of herd testing	27
B. Herd test averages	29
i) Seasonal averages	29
ii) Monthly averages	32
iii) Breed category averages	34
C. Artificial Breeding (AB) statistics	37
D. Herd reproduction	43
E. Calving	46
i) Planned start of calving and median calving dates	46
ii) Calving interval	47
F. Animal Evaluation	48
i) Sire evaluations	49
ii) Cow evaluations	50
<b>5. Prices received</b>	<b>55</b>
A. Milk prices	55
B. Dairy farm land prices	57
<b>6. Disease control</b>	<b>58</b>
A. Tuberculosis (Tb) control	58
<b>Appendix 1: Farming regions and districts</b>	<b>60</b>

# List of tables

---

2.1	Summary of milk production statistics for the last 35 seasons	7
2.2	Summary of herd statistics since 1975/76	9
2.3	Summary of herd production since 1975/76	10
2.4	Average production per cow by herd size in 2021/22	13
3.1	Herd analysis by region in 2021/22	16
3.2	Herd production analysis by region in 2021/22	17
3.3	Herd analysis by district in 2021/22	18
3.4	Herd production analysis by district in 2021/22	20
3.5	Herd analysis by operating structure in 2021/22	22
3.6	Herd production analysis by operating structure in 2021/22	23
3.7	Trend in the percentage of herds in each operating structure for the last 10 seasons	23
3.8	Trend in the number of herds in each operating structure for the last 10 seasons	23
3.9	Operating structure by region in 2021/22	24
3.10	Operating structure by herd size in 2021/22	25
4.1	Trend in the use of herd testing services for the last 20 seasons	27
4.2	Use of herd testing by region in 2021/22	28
4.3	Season herd test averages per cow by region in 2021/22	29
4.4	Trend in the national herd test averages for the last 20 seasons	31
4.5	Monthly herd test averages by region in 2021/22	32
4.6	Herd test averages by breed category and cow age in 2021/22	34
4.7	Liveweight by age and by breed category of cow in 2021/22	35
4.8	Trend in Artificial Breeding use for the last nine seasons by region: Cows and yearlings to AB	37
4.9	Mean herd reproductive performance since 2008/09	43
4.10	Mean 6-week in-calf rate by farming region for the last three seasons	44
4.11	Actual 6-week in-calf rate in 2021/22	45
4.12	Estimated 6-week in-calf rate in 2021/22	45
4.13	Mean calving interval by breed since 2000/01	47
4.14	Economic values used from 10 December 2021	48
4.15	Average Breeding Values and Breeding Worth of 2017-born bulls	49
4.16	Number of sires by birth year and breed category	50
4.17	Herd Breeding Worth in 2021/22	50
4.18	Herd Production Worth in 2021/22	51
4.19	Cow Breeding Worth in 2021/22	51
4.20	Cow Production Worth in 2021/22	52
4.21	Average Breeding Worth and Breeding Values of all cows born in 2019 by breed category	54
4.22	Survivability percentages since 1996/97	54
5.1	Trend in prices received for milksolids for the last 20 seasons	55
5.2	Trend in dairy land sale values for the past ten seasons	57
6.1	Tuberculosis (Tb) testing and results in 2021/22	58

# List of graphs

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2.1	Trend in the number of herds and average herd size for the last 30 seasons	8
2.2	Milksolids production per cow and per effective hectare since 1992/93	11
2.3	Distribution of herds by milksolids production per cow for the last three seasons	12
2.4	Herd size distribution for 2021/22 compared with 2011/12	14
3.1	Regional distribution of dairy cows in 2021/22	15
3.2	Breed category percentages of cows for New Zealand in 2021/22	26
3.3	Breed category percentages of cows by region in 2021/22	26
4.1	Trend in the percentage of herds testing for the last 30 seasons	28
4.2	Average milkfat and protein production per cow by region in 2021/22	30
4.3	Liveweight by age and by breed category of cow in 2021/22	36
4.4	Trend in the percentage of cows to Artificial Breeding for the last 30 seasons	39
4.5	Average number of inseminations per cow for the last 20 seasons	39
4.6	Ayrshire semen usage (%) over breed category for the last five seasons	40
4.7	Holstein-Friesian / Jersey Crossbreed semen usage (%) over breed category for the last five seasons	40
4.8	Jersey semen usage (%) over breed category for the last five seasons	41
4.9	Holstein-Friesian semen usage (%) over breed category for the last five seasons	41
4.10	Trend in the percentage of inseminations of each breed category for the last 40 seasons	42
4.11	Mean actual and estimated 6-week in-calf rate since 2008/09	44
4.12	Distribution of actual 6-week in-calf rate in 2021/22	45
4.13	Distribution of estimated 6-week in-calf rate in 2021/22	45
4.14	Planned start of calving and median calving dates for cows (excluding first calvers) by region	46
4.15	Trend in planned start of calving dates for cows (excluding first calvers) by region	47
4.16	Genetic trend of proven dairy bulls by year of birth	49
4.17	Distribution of Herd Breeding Worth in 2021/22	50
4.18	Distribution of Herd Production Worth in 2021/22	51
4.19	Distribution of Cow Breeding Worth in 2021/22	52
4.20	Distribution of Cow Production Worth in 2021/22	52
4.21	Trend in Breeding Worth for all cows	53
4.22	Trend in Production Worth for all cows	53
5.1	Trend in milksolids payout to dairy farmers for the last 20 seasons	56
6.1	Trend in the number of infected herds since 2006/07	59
6.2	Trend in the number of tuberculous dairy cattle since 2006/07	59



# 1. Introduction

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## Introduction

### *Kia ora and welcome to the 2021/22 edition of New Zealand Dairy Statistics*

We are pleased to present the 2021/22 edition of New Zealand Dairy Statistics, the annual census of the national dairy herd. Each year it provides the largest and most comprehensive range of statistical analyses on current, historic and emerging trends in the New Zealand dairy sector.

This is the first New Zealand Dairy Statistics published since herd companies have been able to send data directly to the Dairy Industry Good Animal Database (DIGAD), which looks retrospectively at the 2021/22 Dairy Statistics.

This report includes the latest milk production, herd improvement, animal evaluation and reproduction statistics with regional breakdowns.

Despite the highest average dairy co-operative payout of \$9.52 per kg milksolids, the 2021/22 season had plenty of challenges for the New Zealand dairy industry. New Zealand farmers were hampered by the ongoing impacts of Covid-19, climatic challenges, inflationary pressures and global supply chain issues. This is borne out in the 2021/22 statistics, with a 4.3% decrease in litres and 4.1% decrease in kilograms of milksolids processed, and a 1.26% decrease in total cow population at 4.84 million compared to the previous season. Even with these decreases, the dairy industry continues to play a significant role in delivering economic growth for New Zealand in a changing climate with dairy exports reaching a record \$22 billion in 2021/22.

Farmers are focused on gaining better data and insights for managing on-farm decisions and improving cow quality, with an increasing uptake of herd improvement services and record herd testing levels reached this year. The number of cows artificially inseminated remained steady at 3.94 million.

Farmers and the wider dairy industry remain committed to building on our industry's environmental credentials with a strong shift toward sustainable, lower-emission farming. The industry's collective commitment to being world-leading in our management of impacts on the environment will continue to create real value for New Zealand farmers and ensure they retain their position as the world's most efficient dairy milk producers.



**Dr Tim Mackle**  
Chief Executive  
DairyNZ



**David Chin**  
Chief Executive  
Livestock Improvement Corporation

This report has been jointly produced by Livestock Improvement Corporation (LIC) and DairyNZ since 2006/7.

LIC is a farmer-owned co-operative and world leader in pasture based dairy genetics and herd management. LIC exists to deliver superior genetics and technological innovation to help its shareholders sustainably farm profitable animals.

DairyNZ is the industry organisation representing New Zealand's dairy farmers, funded by farmers through a levy on milksolids.

Data is sourced from the LIC Herd Improvement Database, New Zealand dairy companies, Dairy Industry Good Animal Database, Animal Evaluation database, TB Free New Zealand, Real Estate Institute of New Zealand, and Statistics New Zealand.

## Executive Summary

New Zealand's dairy industry continues to see a trend of declining cow and herd numbers. This year also saw a slight decrease in litres of milk and milksolids produced, with production affected by the impacts of Covid-19, climatic challenges, inflationary pressures and global supply chain issues.

The 2021/22 season saw a record average dairy cooperative payout from Fonterra and Tatua at \$9.52 per kg milksolids, helping to offset the rise in costs on farm.

New Zealand dairy farmers continued to embrace a range of tools to improve herd sustainability and productivity, with the number of cows herd tested being the highest on record. Herd testing is one of a number of tools that farmers are using to help improve milk quality and production through their on farm management and better animal evaluation for the sector.

In this year's publication it is noted that there has been more statistical movement than usually expected in areas such as animal liveweight, breed composition of the national herd and the level of artificial breeding. Please note these changes may also be reflected in years previous to the 2021/22 season. This is a result of the transition towards herd companies sending data directly to the Dairy Industry Good Animal Database (DIGAD) and a change in our reporting methodology. These changes ensure our data remains consistent for future years and enables additional insights and analysis for New Zealand's dairy sector.

### Milk Production

In the 2021/22 season, dairy companies processed 20.78 billion litres of milk containing 1.87 billion kilograms of milksolids – a 4.3% (~929 million litres) decrease in litres and a 4.1% (~79 million kg) decrease in kilograms of milksolids processed compared with the previous season.

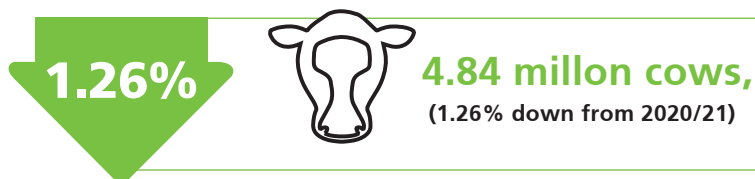
Average milk production per cow was 386 kg of milksolids (made up of 216 kg milkfat and 169 kg protein), a 2.9% decrease from 397 kg last season and back to similar levels as 2019/20 season. Average milksolids per effective hectare (1,098 kg) was also back to 2019/20 levels.



### Cow Numbers

*Cow numbers decreased.*

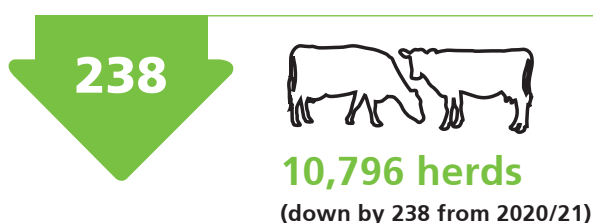
Cow numbers have continued to decline in recent years. The total cow population in 2021/22 was 4.84 million, a decrease of 1.26% from the previous season.



### Dairy Herd Size

*New Zealand dairy herds are becoming bigger, but the number of herds fell.*

There were 10,796 herds this season – 238 fewer than the previous season. The average herd size was 449, which was five cows higher than the previous season.



## Herd Improvement

### a) Herd testing – know your cows

*The number of cows being herd tested was the highest on record.*

Herd testing enables farmers to collect information about individual cows in their herds – this includes information on milk production, milksolid makeup and somatic cell count, as an indicator of mastitis. The information gained from herd testing is used for effective herd management, monitoring and improving cow wellbeing and on-farm decision making.

Herd testing data is also used (alongside other animal data) to inform animal evaluation. These are the critical evaluations that help farmers identify the best animals for breeding, which lifts the performance of their herds.

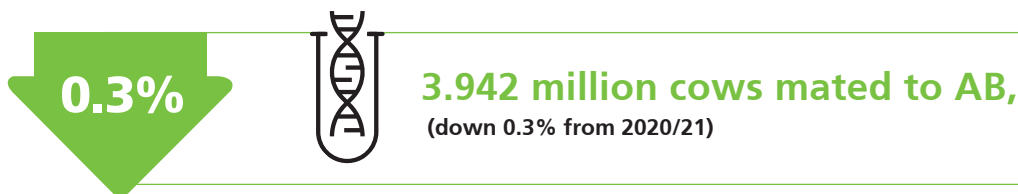
A total of 3.79 million cows were herd tested in 2021/22 – the highest on record. That equates to 78.3% of cows in the national herd being herd tested in 2021/22. Both the percentage of total herds and percentage of total cows herd tested increased.



### b) Artificial breeding (AB) – creating genetic and productive gain through the next generation

*The number of cows mated to AB has decreased.*

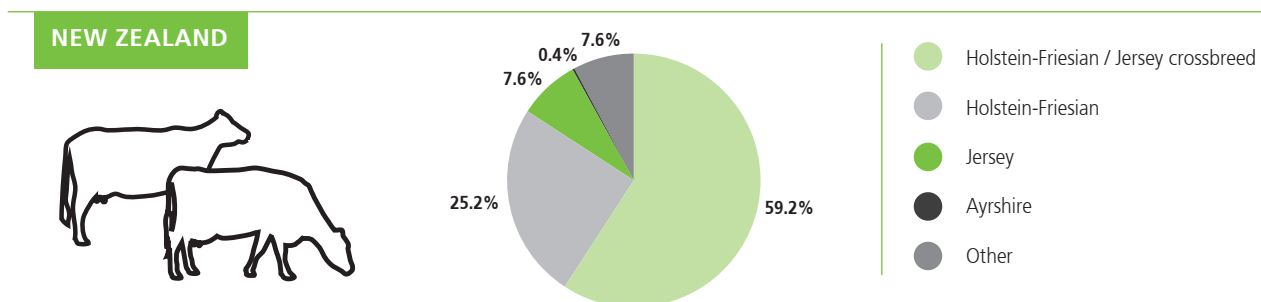
3.942 million cows were mated to AB in 2021/22. The percentage of cows mated to AB was 81.4%, which was lower than the previous season (81.7%), and similar to 2013/14 levels.



## Cow Breed

*Almost 60% of cows are Holstein-Friesian/Jersey crossbred.*

Farmers are increasingly shifting to crossbred cows to benefit from the efficiencies of hybrid vigour and get the best traits from the two main dairy breeds. 59.2% of cows are Holstein-Friesian/Jersey crossbred, a 0.9% increase from the previous season. 25.2% of cows are Holstein-Friesian, 7.6% are Jersey cows, 0.4% are Ayrshire cow and 7.6% of cows are other breeds.



## Milk Prices

*\$9.52 was the average dairy co-operative payout.*

The average dairy co-operative payout of \$9.52 per kg milksolids in 2021/22 was higher than the previous season (\$7.76) and the highest average payout on record.





## 2. National dairy statistics

### A. Industry statistics

#### i) Production

- *Milk volume and milksolids both decreased*

In 2021/22, dairy companies processed 20.8 billion litres of milk containing 1.87 billion kilograms of milksolids (Table 2.1). Total milksolids decreased by 4.1% from the record 1.947 billion kilograms processed in the previous season. Since 2013/14 milksolids processed has been in the range of 1.8 to 1.9 billion kilograms.

**Table 2.1: Summary of milk production statistics for the last 35 seasons**

Season	Milk processed (million litres)	Milkfat processed (million kgs)	Protein processed (million kgs)	Milksolids processed (million kgs)
1987/88	6,921	333	245	579
1988/89	6,533	311	237	541
1989/90	6,868	330	242	572
1990/91	7,077	343	254	599
1991/92	7,454	365	270	637
1992/93	7,629	373	277	651
1993/94	8,603	423	313	736
1994/95	8,633	422	311	733
1995/96	9,325	452	335	788
1996/97	10,339	506	375	880
1997/98	10,651	513	378	891
1998/99	10,563	503	377	880
1999/00	11,630	560	421	981
2000/01	12,925	626	470	1,096
2001/02	13,607	657	495	1,152
2002/03	13,906	676	515	1,191
2003/04	14,599	716	538	1,254
2004/05	14,103	694	519	1,213
2005/06	14,702	724	543	1,267
2006/07	15,134	750	566	1,316
2007/08	14,745	722	548	1,270
2008/09	16,044	791	602	1,393
2009/10	16,483	817	622	1,438
2010/11	17,339	859	654	1,513
2011/12	19,129	954	731	1,685
2012/13	18,883	939	719	1,658
2013/14	20,657	1,034	791	1,825
2014/15	21,253	1,067	823	1,890
2015/16	20,914	1,050	812	1,862
2016/17	20,702	1,042	809	1,851
2017/18	20,724	1,035	804	1,840
2018/19	21,217	1,056	828	1,884
2019/20	21,145	1,059	836	1,896

(table 2.1 continued)

2020/21	21,705	1,089	858	1,947
2021/22	20,776	1,047	821	1,868

**Note:** Prior to 1998/99, Table 2.1 consisted of milk production statistics that were processed into export products (i.e., town milk supply was excluded). These statistics on milk, milkfat, protein and milksolids processed were provided by the New Zealand Dairy Board and are no longer available. Consequently, totals from 1998/99 include all milk processed by New Zealand dairy companies, including milk for the domestic market.

## ii) Population

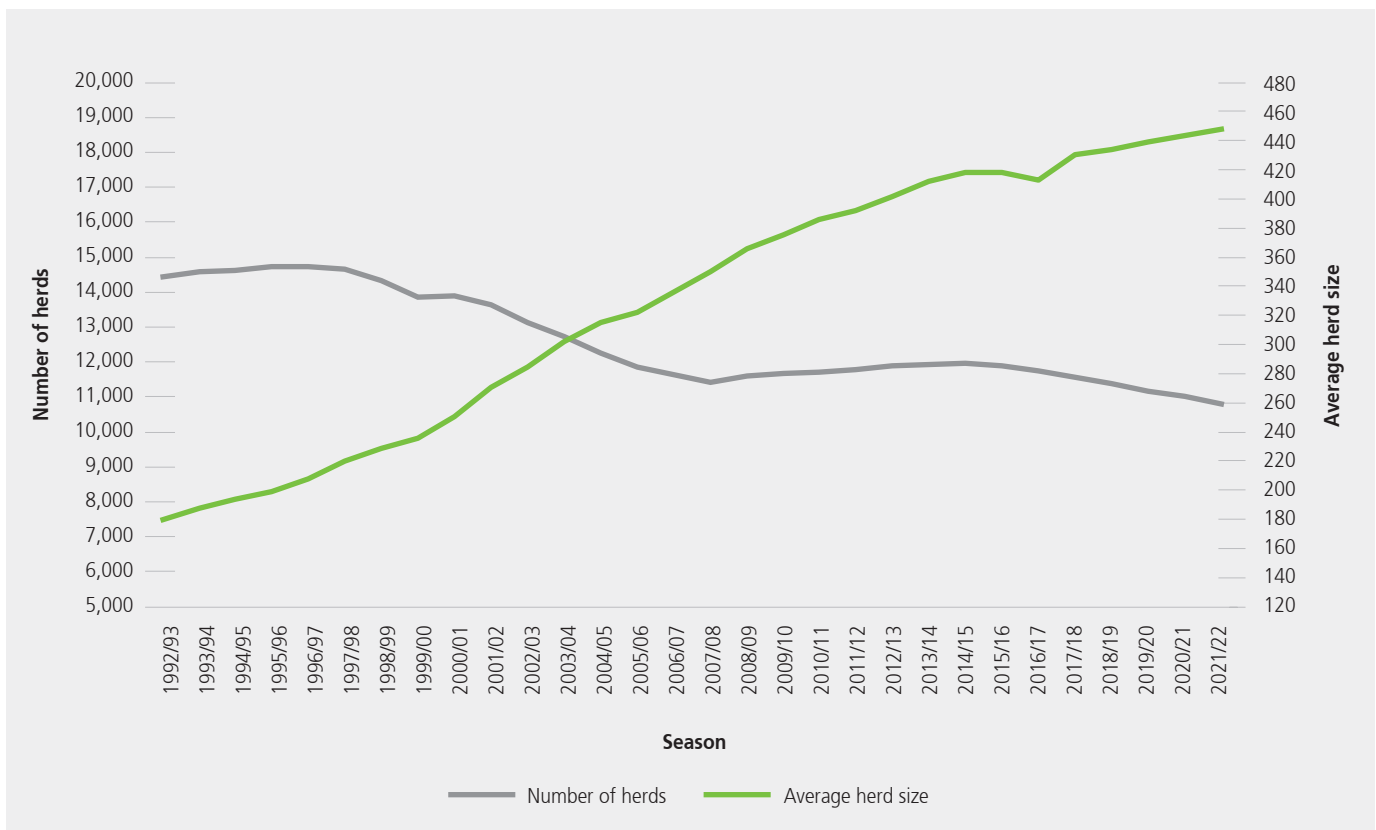
- Number of herds decreased
- Average herd size increased

Between 1997-98 and 2007-08 total herd numbers declined at an average rate of about 300 herds per season (Graph 2.1), before levelling off. After seven consecutive seasons of small increases, the 2015-16 season again saw herd numbers decline. The rate of decline over the past seven years has been about 168 herds per season. The total number of herds in the 2021/22 season decreased by 238 to 10,796.

The average herd size was 449 in 2021/22, which was 5 cows higher than the previous season. The average herd size has more than doubled in the last 30 seasons, and has increased by 164 cows in the last 20 seasons. The rate of increase has slowed in the last 10 seasons, with the average herd size increasing by less than five cows per year.

Expansion of the dairy herd in the South Island has contributed to the increase in average herd sizes.

**Graph 2.1: Trend in the number of herds and average herd size for the last 30 seasons**



The total cow population in the 2021/22 season was 4.84 million (Table 2.2), a decrease of 1.26% from the previous season. Average farm size increased to 158 effective hectares. A stocking rate of 2.85 cows per hectare was a slight decrease on the previous season. Total effective hectares (milking platform with support block excluded) were 1.701 million – a decrease of about 12,000 ha on the previous season.

**Table 2.2: Summary of herd statistics since 1975/76**

Season	Herds	Total cows	Total effective hectares <sup>a</sup>	Average herd size	Average effective hectares <sup>b</sup>	Average cows per hectare <sup>b</sup>
1975/76	18,442	2,091,950	-	113	-	-
1980/81	16,089	2,027,096	-	126	-	-
1985/86	15,753	2,321,012	1,008,192	147	64	2.30
1990/91	14,685	2,402,145	1,023,545	164	70	2.35
1991/92	14,452	2,438,641	-	169	-	-
1992/93	14,458	2,603,049	1,069,892	180	74	2.43
1993/94	14,597	2,736,452	1,122,509	188	77	2.44
1994/95	14,649	2,830,977	1,175,940	193	80	2.41
1995/96	14,736	2,935,759	1,208,352	199	82	2.43
1996/97	14,741	3,064,523	1,267,726	208	86	2.42
1997/98	14,673	3,222,591	1,276,551	220	87	2.52
1998/99	14,362	3,289,319	1,306,942	229	91	2.52
1999/00	13,861	3,269,362	1,292,566	236	93	2.53
2000/01	13,892	3,485,883	1,329,173	251	96	2.62
2001/02	13,649	3,692,703	1,404,930	271	103	2.63
2002/03	13,140	3,740,637	1,463,281	285	111	2.56
2003/04	12,751	3,851,302	1,421,147	302	111	2.71
2004/05	12,271	3,867,659	1,411,594	315	115	2.74
2005/06	11,883	3,832,145	1,398,966	322	118	2.74
2006/07	11,630	3,916,812	1,412,925	337	121	2.77
2007/08	11,436	4,012,867	1,436,549	351	126	2.79
2008/09	11,618	4,252,881	1,519,117	366	131	2.80
2009/10	11,691	4,396,675	1,563,495	376	134	2.81
2010/11	11,735	4,528,736	1,638,706	386	140	2.76
2011/12	11,798	4,634,226	1,638,546	393	139	2.83
2012/13	11,891	4,784,250	1,677,395	402	141	2.85
2013/14	11,927	4,922,806	1,716,464	413	144	2.87
2014/15	11,970	5,018,333	1,746,156	419	146	2.87
2015/16	11,918	4,997,811	1,751,704	419	147	2.85
2016/17	11,748	4,861,324	1,728,702	414	147	2.81
2017/18	11,590	4,992,914	1,755,148	431	151	2.84
2018/19	11,372	4,946,305	1,743,673	435	153	2.84
2019/20	11,179	4,921,548	1,730,374	440	155	2.84
2020/21	11,034	4,903,733	1,713,515	444	155	2.86
2021/22	10,796	4,842,122	1,701,380	449	158	2.85

- Not available

<sup>a</sup> Total effective hectares between 1981/82 and 1999/00 are estimates.

<sup>b</sup> Average effective hectares and average cows per hectare for 1981/82 to 1990/91 are based on factory supply herds only.

**Note:** The number of cows used to calculate the average herd size since 1992/93 includes all cows lactating in that season, whereas in earlier years the number of cows used to produce the average herd size was based only on those cows lactating on 31 December. This change in method has had a small effect on reported cow numbers

## B. Herd production statistics

- Milk production per herd and per cow decreased
- Milksolids per effective hectare decreased

Herd production has increased most years since 1992/93 (Table 2.3), with the exception of the drought years of 1998/99, 2007/08 and 2012/13, and this season, 2021/22. The average milksolids per effective hectare of 1,098 kg in 2021/22 was down 39 kg on the record high of 2020/21 (1,137 kg), but was still the second highest average on record.

Milk production per cow decreased by 11 kg compared to the previous season, with an average of 386 kg milksolids (comprising 216 kg milkfat and 169 kg protein).

**Table 2.3: Summary of herd production since 1975/76**

Season	Average litres per herd	Average kg milkfat per herd	Average kg protein per herd	Average kg milksolids per herd	Average kg milkfat per effective hectare	Average kg protein per effective hectare	Average kg milksolids per effective hectare	Average litres per cow	Average kg milkfat per cow	Average kg protein per cow	Average kg milksolids per cow
1975/76 <sup>a</sup>	-	15,700	-	-	-	-	-	-	137	-	-
1980/81 <sup>a</sup>	-	18,864	-	-	-	-	-	-	147	-	-
1985/86 <sup>a</sup>	-	23,489	-	-	379	-	-	-	157	-	-
1990/91 <sup>a</sup>	-	24,495	-	-	351	-	-	-	148	-	-
1991/92 <sup>b</sup>	-	26,567	-	-	-	-	-	-	157	-	-
1992/93	554,040	26,982	20,138	47,120	374	279	653	-	148	111	259
1993/94	618,139	30,220	22,458	52,678	407	301	708	-	160	119	278
1994/95	614,203	29,886	22,117	52,002	386	285	671	-	156	115	271
1995/96	663,248	32,050	23,827	55,877	405	300	705	-	163	120	283
1996/97	728,874	35,436	26,387	61,823	425	316	741	-	173	128	301
1997/98	752,399	36,383	26,984	63,367	430	318	748	-	168	124	292
1998/99	735,544	35,047	26,254	61,301	392	292	684	-	147	109	256
1999/00	839,066	40,365	30,396	70,761	439	329	768	-	165	123	288
2000/01	930,047	45,063	33,850	78,914	472	353	825	-	177	133	310
2001/02	996,904	48,137	36,300	84,436	471	353	824	-	175	132	307
2002/03	1,058,307	51,447	39,174	90,621	471	357	828	-	179	136	315
2003/04	1,144,938	56,150	42,171	98,321	509	380	889	3,737	184	138	322
2004/05	1,149,262	56,520	42,305	98,825	494	368	862	3,574	176	132	308
2005/06	1,237,228	60,955	45,705	106,660	520	387	907	3,763	186	139	325
2006/07	1,301,308	64,495	48,687	113,182	534	400	934	3,791	189	142	330
2007/08	1,289,337	63,158	47,876	111,033	498	375	873	3,567	175	132	307
2008/09	1,381,573	68,116	51,850	119,966	524	396	921	3,710	184	139	323
2009/10	1,409,875	69,859	53,184	123,043	519	392	912	3,642	181	137	318
2010/11	1,477,531	73,184	55,762	128,946	524	399	923	3,829	190	144	334
2011/12	1,621,344	80,875	61,936	142,811	582	446	1,028	4,128	206	158	364
2012/13	1,587,980	78,948	60,462	139,410	560	429	988	3,947	196	150	346
2013/14	1,731,985	86,682	66,330	153,012	602	461	1,063	4,196	210	161	371
2014/15	1,775,501	89,152	68,734	157,886	611	471	1,082	4,235	213	164	377
2015/16	1,754,836	88,132	68,091	156,223	600	463	1,063	4,185	210	162	372
2016/17	1,762,152	88,667	68,892	157,560	603	468	1,071	4,259	214	167	381
2017/18	1,788,051	89,320	69,413	158,733	590	458	1,048	4,151	207	161	368
2018/19	1,865,731	92,868	72,806	165,674	606	475	1,081	4,290	214	167	381
2019/20	1,891,481	94,770	74,824	169,595	612	483	1,096	4,296	215	170	385
2020/21	1,967,106	98,681	77,822	176,503	635	501	1,137	4,426	222	175	397
2021/22	1,924,392	96,993	76,001	172,994	615	482	1,098	4,291	216	169	386

- Not available

<sup>a</sup> Figures prior to 1991/92 exclude town milk herds

<sup>b</sup> 1991/92 figures include some town milk herds

### i) Production per cow and per hectare

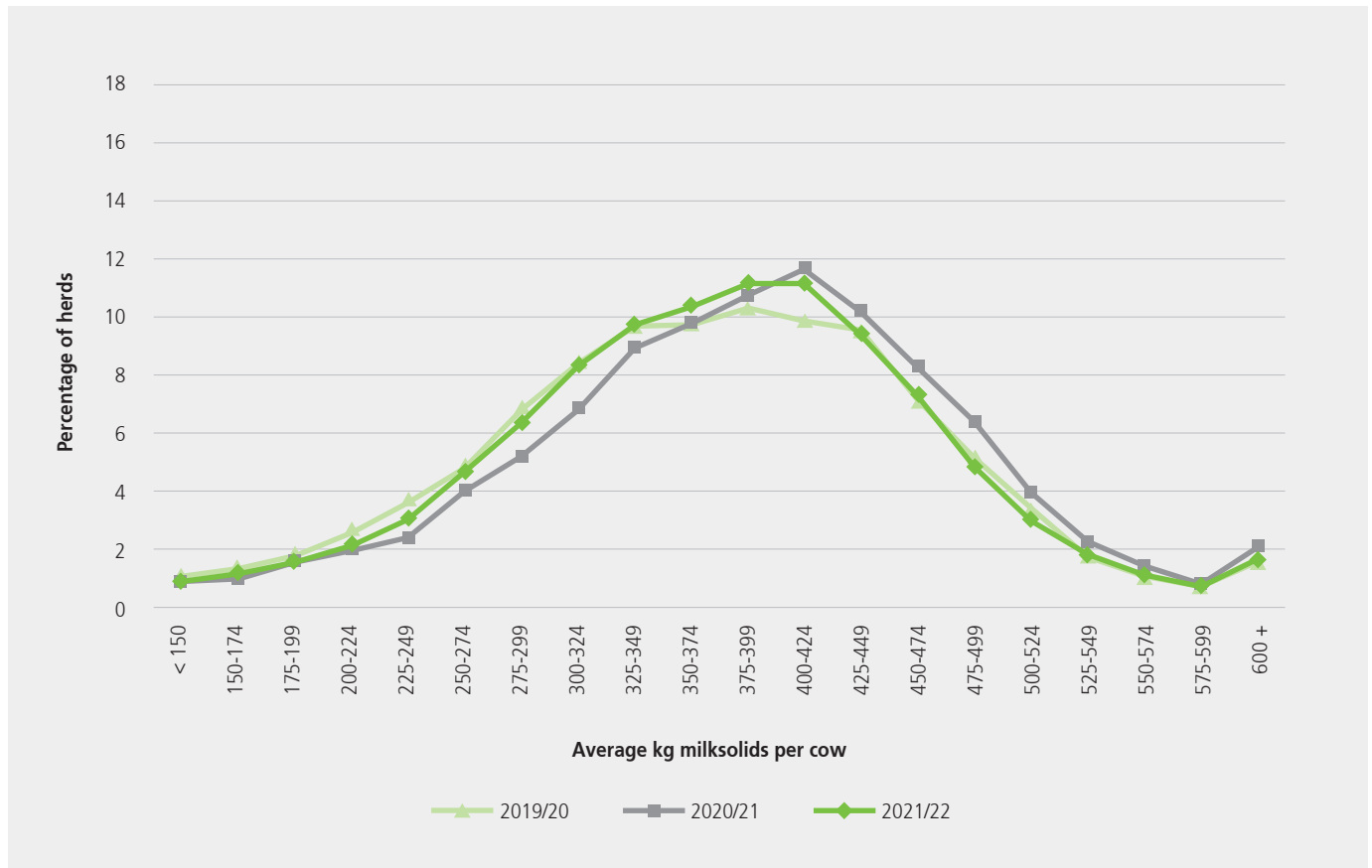
Average milksolids per cow in 2021/22 was 386 kg, compared with 397 kg last season (Graph 2.2). Average milk production per hectare was 1,098 kg – 39 kg down on last season. Variations from season to season are masked by the considerable effect of the weather on each season’s actual production. For example, widespread drought in 2012/13 caused milk production to decline while in 2013/14, favourable pasture growth conditions, coupled with increased supplementary feed use, enabled high milk production.

Graph 2.2: Milksolids production per cow and per effective hectare since 1992/93



Average production per cow varies considerably from farm to farm. This variation is caused by many factors, including temperature, rainfall, soil fertility (which affects pasture growth), stocking rate, the genetic merit of the herd, level of supplementary feed and farm management practice. Graph 2.3 shows the distribution of milksolids production in 2021/22 compared with the previous two seasons. Sixty percent of herds recorded milksolids production between 300 and 450 kilograms per cow. While 20% of the herds had an average production of over 450 kilograms milksolids per cow, compared with 25% in the previous season and similar to the 20.7% in 2019/20. In 2021/22, 8.2% of herds recorded over 500 kg milksolids per cow.

**Graph 2.3: Distribution of herds by milksolids production per cow for the last three seasons**





## ii) Herd size distribution

- 54.5% of herds have less than 400 cows
- 16.7% of herds have 700 or more cows

Fifty-four percent (5,884) of herds had fewer than 400 cows (Table 2.4). In 2021/22, herd size distributions remained proportionately the same as they were the previous season, where 33% of herds (3,555) had 500 or more cows, 14% (1,531) had 750 or more cows, and 6% (663) had 1,000 cows or more. Averages of milkfat, protein and milksolids per cow, by herd size, are also included in Table 2.4.

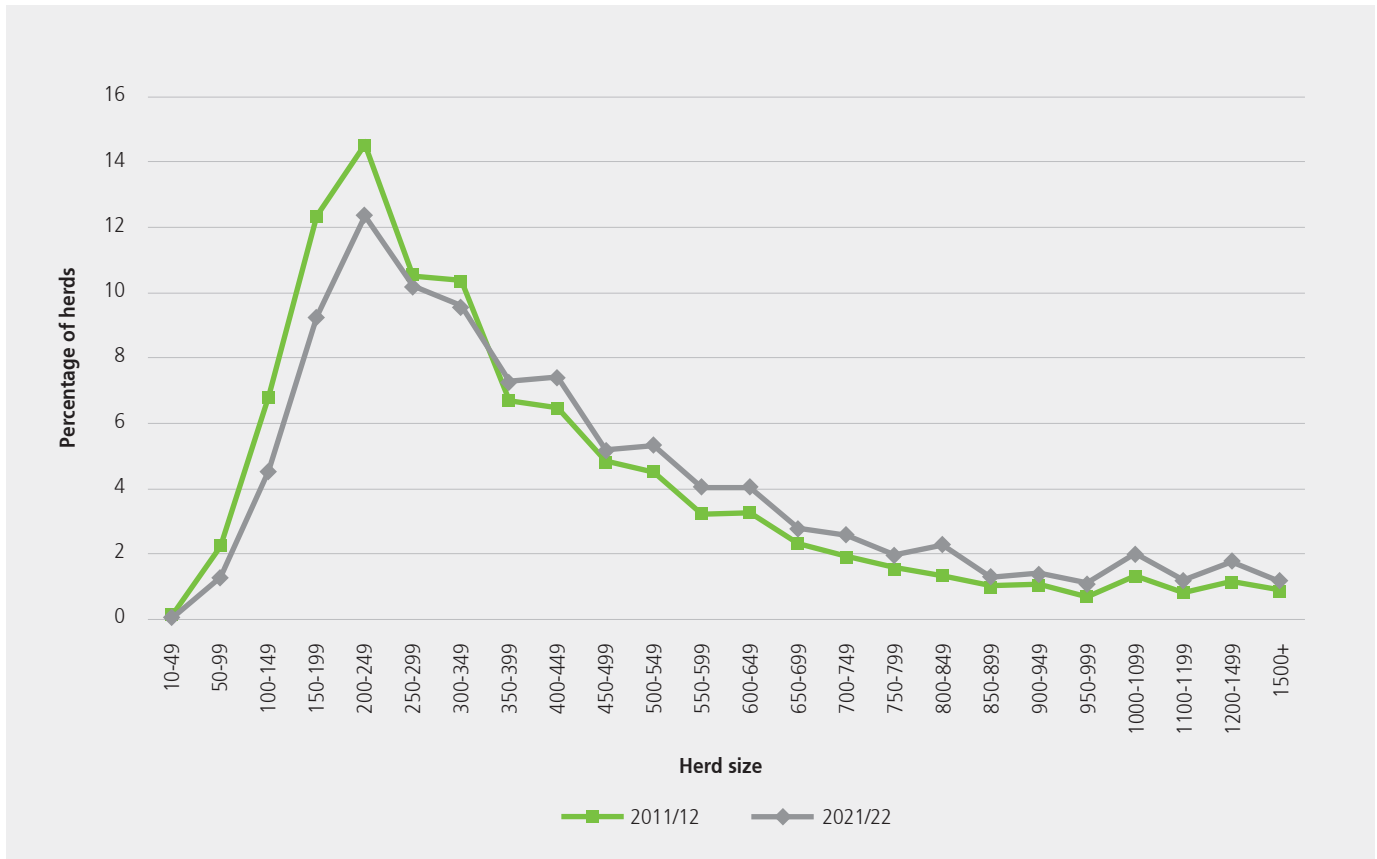
Aside from the 146 herds with fewer than 100 animals, the average milksolids per cow varies between 318 kg (herds with 100-149 cows) and 415 kg (herds with 850-899 cows).

**Table 2.4: Average production per cow by herd size in 2021/22**

Herd size	Number of herds	Percentage of herds	Number of cows	Percentage of cows	Average kg milkfat per cow	Average kg protein per cow	Average kg milksolids per cow
10-49	5	0.0	201	0.0	309	237	546
50-99	141	1.3	11,547	0.2	131	101	233
100-149	489	4.5	60,980	1.3	179	139	318
150-199	997	9.2	173,614	3.6	204	158	362
200-249	1,334	12.4	294,876	6.1	205	158	363
250-299	1,100	10.2	296,414	6.1	212	164	376
300-349	1,034	9.6	329,568	6.8	210	162	372
350-399	784	7.3	289,343	6.0	220	170	390
400-449	798	7.4	333,061	6.9	219	171	389
450-499	559	5.2	261,364	5.4	220	171	392
500-549	575	5.3	295,774	6.1	223	174	396
550-599	437	4.0	248,137	5.1	222	174	396
600-649	435	4.0	267,989	5.5	228	179	407
650-699	299	2.8	199,167	4.1	222	175	397
700-749	278	2.6	198,818	4.1	226	180	406
750-799	211	2.0	161,867	3.3	228	180	408
800-849	247	2.3	200,871	4.1	226	178	403
850-899	140	1.3	120,998	2.5	232	183	415
900-949	151	1.4	138,247	2.9	228	181	409
950-999	119	1.1	114,677	2.4	218	172	390
1000-1099	217	2.0	223,256	4.6	222	175	397
1100-1199	129	1.2	145,649	3.0	222	176	398
1200-1499	190	1.8	245,900	5.1	213	169	382
1500+	127	1.2	229,805	4.7	177	142	319
<b>Total/Avg</b>	<b>10,796</b>		<b>4,842,122</b>		<b>216</b>	<b>169</b>	<b>386</b>

The distribution of herd size presented in Graph 2.4 shows an increase in the number of herds with 350 or more cows, and a decrease in the number of herds with fewer than 350 cows, compared with ten seasons ago. The most common herd size remains in the range 200 to 249 cows (comprising 12.36% of herds in 2021/22, compared with 14.5% in 2011/12).

**Graph 2.4: Herd size distribution for 2021/22 compared with 2011/12**



# 3. Regional dairy statistics

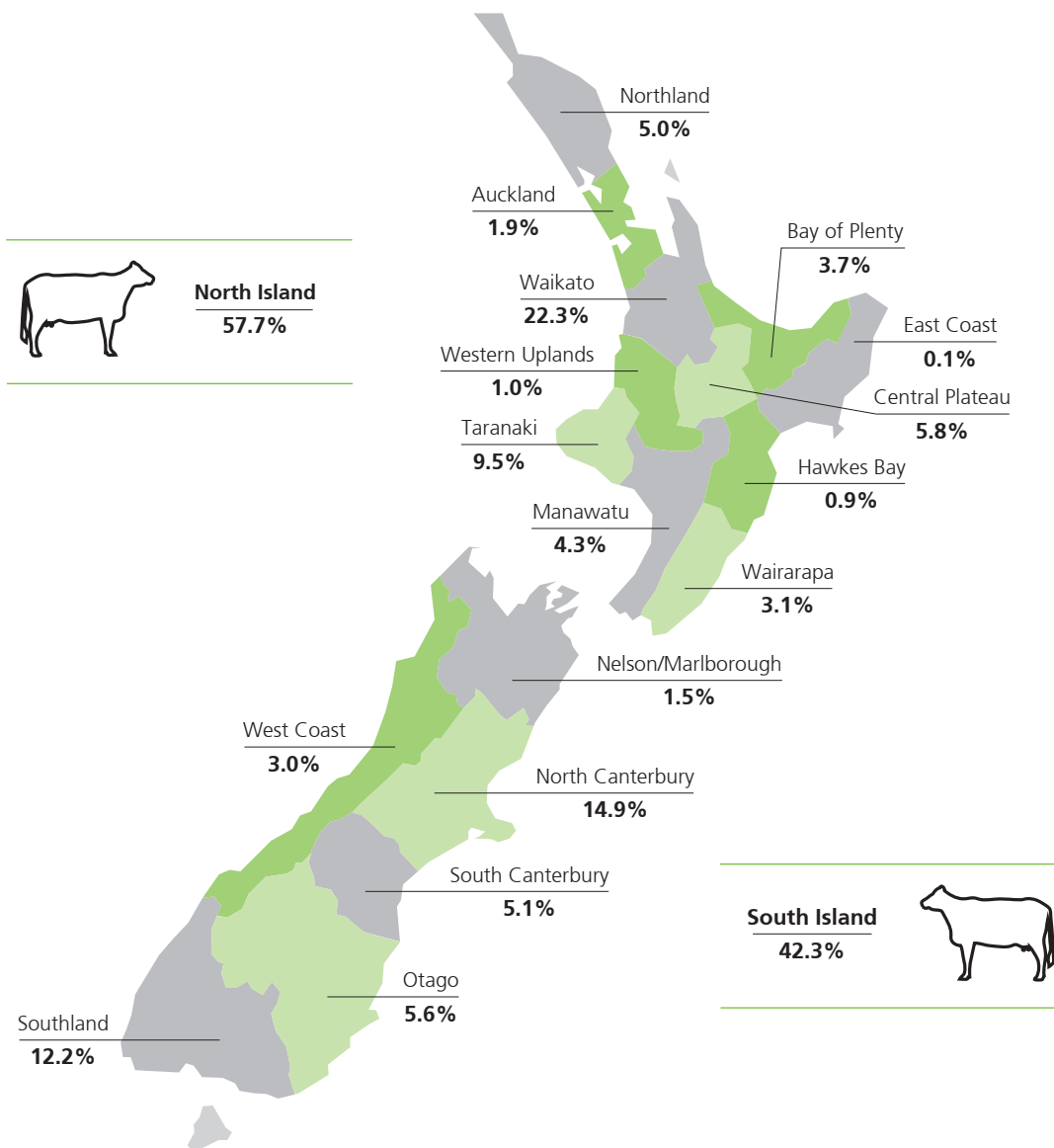
## A. Regions

- 70.7% of dairy herds are located in the North Island
- 42.3% of dairy cows are located in the South Island

The majority of dairy herds (70.7%) are located in the North Island, with the greatest concentration (28.3%) situated in the Waikato region. Taranaki, with 14% of dairy herds, is the next largest region followed by Southland with 9.1%.

Although South Island dairy herds account for 29.3% of the national total, they contain 42.3% of all cows milked (Graph 3.1). The Waikato region has the highest share of all dairy cows with 22.3%, followed by North Canterbury (14.9%), Southland (12.2%) and Taranaki (9.5%).

Graph 3.1: Regional distribution of dairy cows in 2021/22



- *Largest average herd size (820) in North Canterbury*

Farms in the South Island are, on average, larger than those in the North Island (both in terms of farm area and cow numbers, see Table 3.1). However, this season the average herd size increased slightly only in the North Island, while the South Island herd size average remained the same. Within the South Island, North Canterbury has the largest average herd size (820 cows). In the North Island, Hawkes Bay has the largest average herd size of 669 cows. The smallest average herd sizes remain in Auckland, Taranaki, and Northland, averaging 291, 304 and 330 cows, respectively. North and South Canterbury have the highest average cows per hectare (3.49 and 3.36 respectively). The regions with the lowest average cows per hectare are the West Coast (2.19) and Northland (2.26).

*Table 3.1: Herd analysis by region in 2021/22*

<i>Farming region</i>	<i>Total herds</i>	<i>Percentage of herds</i>	<i>Total cows</i>	<i>Percentage of cows</i>	<i>Total effective hectares</i>	<i>Percentage of effective hectares</i>	<i>Average herd size</i>	<i>Average effective hectares</i>	<i>Average cows per hectare</i>
Northland	737	6.8	243,014	5.0	107,558	6.3	330	146	2.26
Auckland	322	3.0	93,597	1.9	38,140	2.2	291	118	2.45
Waikato	3,051	28.3	1,081,321	22.3	368,248	21.6	354	121	2.94
Bay of Plenty	491	4.5	178,646	3.7	62,959	3.7	364	128	2.84
Central Plateau	476	4.4	281,556	5.8	103,317	6.1	592	217	2.73
Western Uplands	87	0.8	47,506	1.0	18,428	1.1	546	212	2.58
East Coast	9	0.1	4,938	0.1	1,980	0.1	549	220	2.49
Hawkes Bay	66	0.6	44,139	0.9	15,258	0.9	669	231	2.89
Taranaki	1,515	14.0	460,243	9.5	165,198	9.7	304	109	2.79
Manawatu	492	4.6	210,308	4.3	79,128	4.7	427	161	2.66
Wairarapa	386	3.6	148,169	3.1	54,640	3.2	384	142	2.71
<b>North Island</b>	<b>7,632</b>	<b>70.7</b>	<b>2,793,437</b>	<b>57.7</b>	<b>1,014,854</b>	<b>59.6</b>	<b>366</b>	<b>133</b>	<b>2.75</b>
Nelson/Marlborough	195	1.8	73,659	1.5	26,405	1.6	378	135	2.79
West Coast	357	3.3	147,082	3.0	67,239	4.0	412	188	2.19
North Canterbury	879	8.1	720,520	14.9	206,707	12.1	820	235	3.49
South Canterbury	310	2.9	245,184	5.1	73,058	4.3	791	236	3.36
Otago	443	4.1	270,611	5.6	92,544	5.4	611	209	2.92
Southland	980	9.1	591,629	12.2	220,573	13.0	604	225	2.68
<b>South Island</b>	<b>3,164</b>	<b>29.3</b>	<b>2,048,685</b>	<b>42.3</b>	<b>686,526</b>	<b>40.4</b>	<b>647</b>	<b>217</b>	<b>2.98</b>
<b>New Zealand</b>	<b>10,796</b>		<b>4,842,122</b>		<b>1,701,380</b>		<b>449</b>	<b>158</b>	<b>2.85</b>

- *Highest average production per herd recorded in North Canterbury*

South Island farms have, on average, higher herd production than herds in the North Island, with North Canterbury recording the highest average herd production at 344,347 kilograms of milksolids (Table 3.2). This reflects a combination of larger herd sizes, a high stocking rate, and high kilograms of milksolids per cow. In the North Island, Hawkes Bay recorded the highest average herd production of 249,103 kilograms of milksolids, reflecting large herd sizes.

In 2021/22, average production per effective hectare and production per cow was higher in the South Island than in the North Island. North Canterbury recorded the highest average milksolids per hectare in the South Island for the 15th season in a row, with 1,464 kg per hectare. Taranaki had the highest average milksolids production per hectare in the North Island (1,096 kg).

Southland and South Canterbury had the highest average milksolids per cow (422 kg). In the North Island, Taranaki had the highest average milksolids per cow (394 kg).

**Table 3.2: Herd production analysis by region in 2021/22**

<i>Farming region</i>	<i>Total kg milksolids</i>	<i>Percent milk-solids</i>	<i>Average litres per herd</i>	<i>Average kg milkfat per herd</i>	<i>Average kg protein per herd</i>	<i>Average kg milk-solids per herd</i>	<i>Average kg milkfat per effective hectare</i>	<i>Average kg protein per effective hectare</i>	<i>Average kg milksolids per effective hectare</i>	<i>Average kg milkfat per cow</i>	<i>Average kg protein per cow</i>	<i>Average kg milksolids per cow</i>
Northland	77,699,412	4.2	1,193,252	59,402	46,025	105,427	407	315	722	180	140	320
Auckland	34,067,625	1.8	1,210,608	59,455	46,345	105,800	502	391	893	205	159	364
Waikato	402,536,176	21.6	1,478,578	74,456	57,523	131,979	617	476	1,093	210	162	372
Bay of Plenty	62,428,831	3.3	1,433,233	71,765	55,381	127,146	560	432	992	197	152	349
Central Plateau	102,633,795	5.5	2,427,740	121,559	94,058	215,617	560	433	993	206	159	365
Western Uplands	13,684,865	0.7	1,732,587	89,021	68,277	157,297	420	322	743	163	125	288
East Coast	1,546,022	0.1	1,897,702	96,008	75,772	171,780	436	344	781	175	138	313
Hawkes Bay	16,440,828	0.9	2,817,324	137,668	111,435	249,103	596	482	1,078	206	167	372
Taranaki	181,134,723	9.7	1,308,849	67,551	52,009	119,561	620	477	1,096	222	171	394
Manawatu	82,558,342	4.4	1,904,071	93,878	73,924	167,802	584	460	1,043	220	173	393
Wairarapa	54,929,747	2.9	1,575,640	80,015	62,290	142,305	565	440	1,005	208	162	371
<b>North Island</b>	<b>1,029,660,365</b>	<b>55.1</b>	<b>1,509,617</b>	<b>76,035</b>	<b>58,896</b>	<b>134,931</b>	<b>572</b>	<b>443</b>	<b>1,015</b>	<b>208</b>	<b>161</b>	<b>369</b>
Nelson/ Marlborough	25,734,991	1.4	1,454,241	74,607	57,368	131,974	551	424	975	198	152	349
West Coast	47,274,264	2.5	1,431,783	74,918	57,503	132,421	398	305	703	182	140	321
North Canterbury	302,680,670	16.2	3,829,242	191,119	153,228	344,347	813	652	1,464	233	187	420
South Canterbury	103,379,747	5.5	3,684,711	185,256	148,227	333,483	786	629	1,415	234	187	422
Otago	109,000,873	5.8	2,725,036	136,933	109,119	246,052	655	522	1,178	224	179	403
Southland	249,909,434	13.4	2,801,800	142,386	112,624	255,010	633	500	1,133	236	187	422
<b>South Island</b>	<b>837,979,979</b>	<b>44.9</b>	<b>2,925,361</b>	<b>147,572</b>	<b>117,277</b>	<b>264,848</b>	<b>680</b>	<b>540</b>	<b>1,221</b>	<b>228</b>	<b>181</b>	<b>409</b>
<b>New Zealand</b>	<b>1,867,640,344</b>	<b>100.0</b>	<b>1,924,570</b>	<b>97,002</b>	<b>76,008</b>	<b>173,010</b>	<b>615</b>	<b>482</b>	<b>1,098</b>	<b>216</b>	<b>169</b>	<b>386</b>

## B. Districts

South Taranaki continues to be the district with the highest number of herds (924) followed by Matamata-Piako (828) (Table 3.3), while Southland district continues to have the most cows (440,254), followed by Ashburton (361,117). MacKenzie district in South Canterbury has the highest average herd size for the third season in a row with 982 cows, followed by Ashburton in North Canterbury with 870 cows. The number of owner-operators and sharemilkers is included in Table 3.3. Fifty-six percent of herds are run by owner-operators, while 28.6% of herds are operated by sharemilkers of various types (Table 3.5). The remainder are largely herds with contract milkers.

**Table 3.3: Herd analysis by district in 2021/22**

Region	District	Total herds	Number of owner-operators	Number of contract milkers	Number of share-milkers	Total cows	Total effective hectares	Average herd size	Average effective hectares	Average cows per hectare
Northland	Far North	201	138	14	49	66,018	28,633	328	142	2.31
	Whangarei	255	142	35	71	85,836	36,331	337	142	2.36
	Kaipara	281	191	31	56	91,161	42,594	324	152	2.14
Auckland	Rodney	119	66	18	35	34,857	15,473	293	130	2.25
	Manukau / Papakura	17	11	0	6	4,237	1,789	249	105	2.37
	Franklin	186	99	18	65	54,503	20,878	293	112	2.61
Waikato	Waikato	591	311	84	192	204,207	73,455	346	124	2.78
	Hamilton City	14	9	1	4	4,130	1,444	295	103	2.86
	Waipa	500	262	95	142	189,629	61,842	379	124	3.07
	Otorohanga	337	179	46	112	130,811	44,988	388	133	2.91
	Thames-Coromandel	80	47	19	14	26,129	9,598	327	120	2.72
	Hauraki	341	172	73	94	104,095	38,716	305	114	2.69
	Matamata-Piako	828	362	141	324	272,623	87,060	329	105	3.13
Bay of Plenty	South Waikato	360	168	82	110	149,696	51,145	416	142	2.93
	Western Bay of Plenty	158	94	30	34	58,914	20,933	373	132	2.81
	Tauranga	11	4	3	4	4,963	1,960	451	178	2.53
	Kawerau / Whakatane	255	147	44	59	92,860	32,060	364	126	2.90
	Opotiki	67	35	4	25	21,910	8,005	327	119	2.74
Central Plateau	Taupo	173	114	25	33	138,292	50,838	799	294	2.72
	Rotorua	303	168	48	86	143,264	52,479	473	173	2.73
Western Uplands	Waitomo	60	38	4	18	34,242	13,051	571	218	2.62
	Ruapehu	27	15	2	10	13,264	5,377	491	199	2.47
East Coast	Gisborne / Wairoa	9	6	2	1	4,938	1,980	549	220	2.49
Hawkes Bay	Napier / Hastings	27	18	5	4	15,287	5,701	566	211	2.68
	Central Hawkes Bay	39	29	3	7	28,852	9,557	740	245	3.02
Taranaki	New Plymouth	375	213	45	116	103,299	39,732	275	106	2.60
	Stratford	216	133	24	59	55,884	20,925	259	97	2.67
	South Taranaki	924	490	139	290	301,060	104,541	326	113	2.88
Manawatu	Wanganui	18	13	1	4	7,483	3,312	416	184	2.26
	Rangitikei	80	55	12	13	42,007	14,835	525	185	2.83
	Manawatu	229	147	28	54	92,580	35,512	404	155	2.61
	Palmerston North City	43	33	3	6	19,851	7,362	462	171	2.70
	Horowhenua	109	76	10	23	44,156	16,254	405	149	2.72
	Kapiti Coast / Upper Hutt	13	8	2	3	4,231	1,852	325	142	2.28
Wairarapa	Tararua	256	146	42	65	87,251	33,212	341	130	2.63
	Masterton	15	6	3	6	7,921	2,522	528	168	3.14
	Carterton	46	34	7	5	18,813	6,850	409	149	2.75
	South Wairarapa	69	34	19	15	34,184	12,057	495	175	2.84
<b>North Island</b>		<b>7,632</b>	<b>4,213</b>	<b>1,162</b>	<b>2,214</b>	<b>2,793,437</b>	<b>1,014,854</b>	<b>366</b>	<b>133</b>	<b>2.75</b>



(table 3.3 continued)

Region	District	Total herds	Number of owner-operators	Number of contract milkers	Number of share-milkers	Total cows	Total effective hectares	Average herd size	Average effective hectares	Average cows per hectare
Nelson/ Marlborough	Marlborough	45	31	5	8	15,215	5,220	338	116	2.91
	Kaikoura	19	10	2	7	9,206	2,810	485	148	3.28
	Tasman / Nelson City	131	96	13	22	49,238	18,375	376	140	2.68
West Coast	Buller	122	88	11	23	49,645	21,565	407	177	2.30
	Grey	86	59	7	20	39,906	17,802	464	207	2.24
	Westland	149	111	11	27	57,530	27,873	386	187	2.06
North Canterbury	Hurunui	94	50	24	20	78,506	22,518	835	240	3.49
	Waimakariri	99	56	13	30	70,924	20,244	716	204	3.50
	Christchurch City	38	20	10	8	30,315	9,364	798	246	3.24
	Banks Peninsula	6	3	0	3	2,582	813	430	136	3.18
	Selwyn	227	155	31	41	177,076	50,683	780	223	3.49
South Canterbury	Ashburton	415	219	69	127	361,117	103,085	870	248	3.50
	Timaru	178	121	12	45	129,467	37,741	727	212	3.43
	MacKenzie	16	7	1	8	15,709	5,360	982	335	2.93
	Waimate	116	57	14	45	100,008	29,957	862	258	3.34
	Otago	Waitaki	146	66	19	61	104,801	32,133	718	220
Otago	Dunedin City	61	36	3	22	27,488	9,044	451	148	3.04
	Clutha	203	106	21	52	111,916	41,310	551	203	2.71
	Central Otago / Lakes	33	22	4	6	26,406	10,056	800	305	2.63
	Southland	Gore	164	94	18	46	91,879	36,955	560	225
Southland	Invercargill	100	54	17	25	59,496	21,492	595	215	2.77
	Southland	716	372	101	229	440,254	162,126	615	226	2.72
	<b>South Island</b>	<b>3,164</b>	<b>1,833</b>	<b>406</b>	<b>875</b>	<b>2,048,685</b>	<b>686,526</b>	<b>647</b>	<b>217</b>	<b>2.98</b>
<b>New Zealand</b>		<b>10,796</b>	<b>6,046</b>	<b>1,568</b>	<b>3,089</b>	<b>4,842,122</b>	<b>1,701,380</b>	<b>449</b>	<b>158</b>	<b>2.85</b>

Nationally, MacKenzie district had the highest average production per herd again with 403,691 kilograms of milksolids followed by Ashburton with 371,783 kilograms of milksolids (Table 3.4). Hurunui had the highest average milksolids per effective hectare with 1,526 kilograms, while Ashburton had the second highest (1,497 kilograms per hectare). Hurunui also recorded the highest average production per cow (438 kilograms of milksolids) followed closely by Christchurch City district (437 kilograms of milksolids). Within the North Island districts, Central Hawkes Bay had the highest milksolids production per herd with an average of 288,885 kilograms of milksolids, followed by Taupo with 281,755 kilograms. Of all the North Island districts, Masterton and South Waikato again produced the highest average kilograms of milksolids per hectare (1,317 and 1,208 respectively), while Palmerston North City district produced the highest average kilograms of milksolids per cow (428).

**Table 3.4: Herd production analysis by district in 2021/22**

Region	District	Average litres per herd	Average kg milkfat per herd	Average kg protein per herd	Average kg milksolids per herd	Average kg milkfat per effective hectare	Average kg protein per effective hectare	Average kg milksolids per effective hectare	Average kg milkfat per cow	Average kg protein per cow	Average kg milksolids per cow	
Northland	Far North	1,200,016	59,509	46,265	105,774	418	325	743	181	141	322	
	Whangarei	1,289,234	64,251	49,789	114,040	451	349	800	191	148	339	
	Kaipara	1,101,313	54,925	42,436	97,362	362	280	642	169	131	300	
Auckland	Rodney / Auckland	1,105,680	55,497	42,580	98,076	427	327	754	189	145	335	
	Manukau / Papakura	1,043,860	50,706	39,754	90,459	482	378	860	203	160	363	
	Franklin	1,292,980	62,788	49,356	112,144	559	440	999	214	168	383	
Waikato	Waikato	1,421,425	71,191	55,051	126,241	573	443	1,016	206	159	365	
	Hamilton City	1,271,962	63,382	48,600	111,983	615	471	1,086	215	165	380	
	Waipa	1,617,796	81,465	62,888	144,353	659	508	1,167	215	166	381	
	Otorohanga	1,533,774	77,951	59,904	137,855	584	449	1,033	201	154	355	
	Thames-Coromandel	1,141,404	57,615	44,449	102,065	480	370	851	176	136	312	
	Hauraki	1,173,542	58,805	45,493	104,298	518	401	919	193	149	342	
	Matamata-Piako	1,378,038	69,835	53,731	123,566	663	510	1,174	212	163	375	
	South Waikato	1,930,238	96,419	75,265	171,684	679	530	1,208	232	181	413	
	Bay of Plenty	Western Bay of Plenty	1,414,195	71,899	55,165	127,063	543	416	959	193	148	341
		Tauranga	1,503,259	78,627	60,225	138,852	441	338	779	174	133	308
Kawerau / Whakatane		1,499,447	74,560	58,708	123,269	593	458	1,051	205	158	363	
Opotiki		1,214,620	59,688	46,572	106,260	500	390	889	183	142	325	
Central Plateau	Taupo	3,167,041	158,708	123,046	281,755	540	419	959	199	154	352	
	Rotorua	2,005,630	100,349	77,507	177,856	579	448	1,027	212	164	376	
Western Uplands	Waitomo	1,735,997	89,267	68,437	157,704	410	315	725	156	120	276	
	Ruapehu	1,725,008	88,474	67,920	156,394	444	341	785	180	138	318	
East Coast	Gisborne / Wairoa	1,897,702	96,008	75,772	171,780	436	344	781	175	138	313	
Hawkes Bay	Napier / Hastings	2,158,687	107,180	84,461	191,641	508	400	908	189	149	338	
	Central Hawkes Bay	3,273,304	158,775	130,110	288,885	648	531	1,179	215	176	390	
Taranaki	New Plymouth	1,119,559	58,151	44,193	102,344	549	417	966	211	160	372	
	Stratford	1,096,438	56,088	43,109	99,198	579	445	1,024	217	167	383	
	South Taranaki	1,435,326	74,046	57,262	131,309	654	506	1,161	227	176	403	
Manawatu	Wanganui	1,671,205	79,529	63,904	143,433	432	347	780	191	154	345	
	Rangitikei	2,145,114	106,722	84,003	190,725	575	453	1,028	203	160	363	
	Manawatu	1,838,212	91,183	71,594	162,777	588	462	1,050	226	177	403	
	Palmerston North City	2,243,912	110,826	86,981	197,807	647	508	1,155	240	188	428	
	Horowhenua	1,829,638	89,081	70,327	159,408	597	472	1,069	220	174	394	
	Kapiti Coast / Upper Hutt	1,403,290	66,338	53,777	120,115	466	377	843	204	165	369	
Wairarapa	Tararua	1,388,169	70,838	54,840	125,678	546	423	969	208	161	369	
	Masterton	2,521,108	123,401	98,044	221,445	734	583	1,317	234	186	419	
	Carterton	1,744,622	86,422	67,811	154,233	580	455	1,036	211	166	377	
	South Wairarapa	1,952,997	100,360	78,478	178,837	574	449	1,023	203	158	361	
<b>North Island</b>		<b>1,509,617</b>	<b>76,035</b>	<b>58,896</b>	<b>134,931</b>	<b>572</b>	<b>443</b>	<b>1,015</b>	<b>208</b>	<b>161</b>	<b>369</b>	

(table 3.4 continued)

Region	District	Average litres per herd	Average kg milkfat per herd	Average kg protein per herd	Average kg milksolids per herd	Average kg milkfat per effective hectare	Average kg protein per effective hectare	Average kg milksolids per effective hectare	Average kg milkfat per cow	Average kg protein per cow	Average kg milksolids per cow
Nelson/ Marlborough	Marlborough	1,517,390	76,099	58,523	134,623	656	505	1,161	225	173	398
	Kaikoura	2,037,051	103,067	80,919	183,985	697	547	1,244	213	167	380
	Tasman/Nelson City	1,348,020	69,966	53,555	123,521	499	382	881	186	142	329
West Coast	Buller	1,375,304	71,185	54,543	125,728	403	309	711	175	134	309
	Grey	1,679,054	87,134	67,332	154,467	421	325	746	188	145	333
	Westland	1,335,307	70,924	54,253	125,177	379	290	669	184	141	324
North Canterbury	Hurunui	4,064,547	204,049	161,513	365,562	852	674	1,526	244	193	438
	Waimakariri	3,415,474	166,231	134,747	300,977	813	659	1,472	232	188	420
	Christchurch City	3,852,723	193,331	155,521	348,853	785	631	1,416	242	195	437
	Banks Peninsula	1,566,262	83,036	63,177	146,213	613	466	1,079	193	147	340
	Selwyn	3,423,795	171,440	137,360	308,800	768	615	1,383	220	176	396
	Ashburton	4,126,992	206,252	165,531	371,783	830	666	1,497	237	190	427
South Canterbury	Timaru	3,396,625	169,737	135,837	305,574	801	641	1,441	233	187	420
	MacKenzie	4,494,529	222,723	180,968	403,691	665	540	1,205	227	184	411
	Waimate	4,015,075	203,901	162,723	366,625	790	630	1,420	237	189	425
Otago	Waitaki	3,245,242	164,681	131,543	296,224	748	598	1,346	229	183	413
	Dunedin City	2,113,321	105,624	84,593	190,217	712	571	1,283	234	188	422
	Clutha	2,409,545	119,409	94,964	214,374	587	467	1,053	217	172	389
	Central Otago / Lakes	3,495,018	179,836	142,318	322,154	590	467	1,057	225	178	403
Southland	Gore	2,571,027	130,447	102,980	233,427	579	457	1,036	233	184	417
	Invercargill	2,780,900	140,278	110,741	251,019	653	515	1,168	236	186	422
	Southland	2,857,577	145,415	115,095	260,510	642	508	1,150	236	187	424
<b>South Island</b>		<b>2,925,361</b>	<b>147,572</b>	<b>117,277</b>	<b>264,848</b>	<b>680</b>	<b>540</b>	<b>1,221</b>	<b>228</b>	<b>181</b>	<b>409</b>
<b>New Zealand</b>		<b>1,924,570</b>	<b>97,002</b>	<b>76,008</b>	<b>173,010</b>	<b>615</b>	<b>482</b>	<b>1,098</b>	<b>216</b>	<b>169</b>	<b>386</b>

Note: Districts with fewer than four herds have been added to a neighbouring district to preserve anonymity

## C. Operating structures

The main operating structures found on New Zealand dairy farms are owner operator, sharemilker and, to a lesser extent, contract milker.

Owner operators are farmers who own and operate their own farms, or who employ a manager to operate the farm for a fixed wage. Owner-operators receive all the farm income, although they may pay wages. Owner operators comprise the largest group of all operating structures, being 56% of all herds.

Contract milkers (14.5% of herds) are contracted to milk a herd at a set price per kilogram of milksolids produced. The rate is set according to the amount of farm work done.

Sharemilking has traditionally been the first step to farm ownership. Sharemilking involves operating a farm on behalf of the farm owner for an agreed share of the farm receipts (as opposed to a set wage). Two types of sharemilking agreement are commonly used: Variable-order sharemilking and 50/50 or herd-owning sharemilking agreements.

Herd-owning sharemilkers (also called 50/50) own the herd and any equipment (other than the milking plant) needed to farm the property. The sharemilker is usually responsible for milk harvesting expenses, labour, stock-related expenses, and general farm work and maintenance. The owner is usually responsible for expenses related to maintaining the property. The percentage quoted in a 50/50 sharemilking agreement usually refers to the proportion of milk income the sharemilker receives. While this percentage is most commonly 50%, it can range from 45% to 55%. Under the 50/50 agreement the sharemilker receives the agreed percentage of milk income plus the majority of income from stock sales, and the farm owner receives the remaining percentage of milk income.

Unlike the 50/50 agreement, where the owner may have little to do with farm management, a variable-order sharemilking agreement often sees the owner retain some involvement in management of the farm. The variable-order sharemilking agreement involves the farm owner retaining ownership of the herd and bearing more of the farm costs, such as animal health and breeding. The amount of farm work required by the sharemilker is determined by the individual agreement, with responsibility ranging from herd management only to carrying out all farm work.

- 56% of all herds are operated as owner-operators
- 58.8% of all sharemilkers are 50/50 sharemilkers

The number of herds farmed, average herd size, effective area and number of cows per hectare for each of the main operating structures are shown in Table 3.5. Twenty-nine percent (3,089) of New Zealand dairy herds operated under a sharemilking agreement in 2021/22 - a decrease of 56 herds from the previous season. Owner-operators number 6,046 and account for 56% of all herds, reflecting a movement away from sharemilking, particularly variable order, to contract milking with greater certainty of milk income. Fifty-nine percent (1,817) of all sharemilkers have 50/50 agreements. The majority of the variable-order sharemilkers are in the over 50% share group. Contract milkers account for 14.5% of herds.

**Table 3.5: Herd analysis by operating structure in 2021/22**

Operating structure	Number of herds	Percentage of herds	Average herd size	Average effective hectares	Average cows per effective hectare
Owner-operators	6,046	56.0	441	158	2.79
Contract milkers	1,568	14.5	480	163	2.95
<i>Sharemilkers:</i>					
less than 20%	115	1.1	747	237	3.16
20-29%	489	4.5	497	171	2.91
30-49%	149	1.4	437	143	3.06
50/50	1,817	16.8	411	143	2.88
over 50%	517	4.8	456	156	2.92
All sharemilkers	3,089	28.6	446	153	2.91
Unknown	93	0.9			
<b>All farms</b>	<b>10,796</b>	<b>100</b>	<b>449</b>	<b>158</b>	<b>2.85</b>

Herd production in each of the main operating structure groups is shown in Table 3.6. The table shows that, on average, sharemilkers on agreements of less than 20% continue to have the highest production.

**Table 3.6: Herd production analysis by operating structure in 2021/22**

Operating structure	Average litres per herd	Average kg milkfat per herd	Average kg milksolids per herd	Average kg milkfat per effective hectare	Average kg milksolids per effective hectare	Average kg milkfat per cow	Average kg milksolids per cow
Owner-operators	1,868,797	93,853	167,555	593	1,059	213	380
Contract Milkers	2,111,655	106,843	190,340	657	1,170	223	397
<i>Sharemilkers:</i>							
less than 20%	3,503,989	176,218	317,129	744	1,339	236	424
20-29%	2,138,210	107,949	193,022	632	1,130	217	389
30-49%	1,825,848	92,816	165,317	650	1,159	212	378
50/50	1,758,614	89,558	159,141	628	1,115	218	387
over 50%	1,994,130	100,207	179,152	641	1,145	220	393
All Sharemilkers	1,926,431	97,636	174,037	638	1,137	219	390
<b>All farms</b>	<b>1,921,010</b>	<b>96,848</b>	<b>172,764</b>	<b>616</b>	<b>1,098</b>	<b>216</b>	<b>386</b>

Changes to the operating structure in the last ten seasons have seen the percentage of sharemilkers, including 50/50 sharemilkers, decrease overall. Table 3.7 shows the percentage of herds in each operating structure type, whereas Table 3.8 gives the actual number of herds. Sharemilkers have declined from 35.2% in 2012/13 to 28.6% of herds in 2021/22. For the last five seasons, the percentage of herds with contract milkers is shown separately. Prior to this they were included in the Owner-operator category.

**Table 3.7: Trend in the percentage of herds in each operating structure for the last 10 seasons**

Operating structure	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Owner-operators	64.6	65.5	67.3	69.8	72.4	59.9	57.2	56.1	56.2	56.0
Contract Milkers						12.4	12.8	14.3	14.4	14.5
<i>Sharemilkers:</i>										
less than 20%	1.9	1.7	1.5	1.3	1.1	1.1	1.2	1.3	1.1	1.1
20-29%	9.6	9.7	8.8	6.9	5.0	5.1	5.2	5.5	4.8	4.5
30-49%	1.4	1.5	1.4	1.5	1.3	1.4	1.4	1.4	1.3	1.4
50/50	18.7	18.5	17.1	16.8	16.4	15.9	16.9	16.6	16.6	16.8
over 50%	3.5	2.9	3.6	3.5	3.5	3.7	4.6	4.0	4.7	4.8
All sharemilkers	35.2	34.2	32.4	30.0	27.3	27.3	29.3	28.9	28.5	28.6
Other/Unknown	0.3	0.3	0.3	0.3	0.3	0.4	0.7	0.8	0.8	0.9

**Table 3.8: Trend in the number of herds in each operating structure for the last 10 seasons**

Operating structure	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Owner-operators	7,679	7,812	8,059	8,315	8,503	6,940	6,507	6,268	6,206	6,046
Contract Milkers						1,440	1,460	1,597	1,594	1,568
<i>Sharemilkers:</i>										
less than 20%	224	206	179	153	134	122	138	148	117	115
20-29%	1,140	1,151	1,050	821	586	595	589	616	534	489
30-49%	170	177	171	174	157	161	159	159	148	149
50/50	2,229	2,201	2,050	2,001	1,925	1,848	1,919	1,857	1,831	1,817
over 50%	417	346	429	421	406	433	526	447	515	517
All sharemilkers	4,180	4,081	3,879	3,570	3,208	3,159	3,331	3,227	3,145	3,089
Other/Unknown	32	34	32	33	37	51	74	87	89	93
<b>Total</b>	<b>11,891</b>	<b>11,927</b>	<b>11,970</b>	<b>11,918</b>	<b>11,748</b>	<b>11,590</b>	<b>11,372</b>	<b>11,179</b>	<b>11,034</b>	<b>10,796</b>

Table 3.9 compares the number (and percentage) of owner-operators with sharemilkers by region in 2021/22. In the South Island there were more variable order sharemilkers than 50/50 sharemilkers, while the opposite was the case in the North Island.

**Table 3.9: Operating structure by region in 2021/22**

<i>Farming region</i>	<i>Owner-operators</i>	<i>Owner-operators %</i>	<i>Contract milkers</i>	<i>Contract milkers %</i>	<i>All share-milkers</i>	<i>All share-milkers %</i>	<i>50/50 share-milkers</i>	<i>50/50 share-milkers %</i>	<i>Variable order share-milkers</i>	<i>Variable order share-milkers %</i>	<i>Total herds (excl. unknown)</i>	<i>Total herds %</i>
Northland	471	7.8	80	5.1	176	5.7	118	6.5	58	4.6	727	6.8
Auckland	177	2.9	36	2.3	105	3.4	68	3.7	37	2.9	318	3.0
Waikato	1,514	25.0	541	34.5	988	32.0	707	38.9	281	22.2	3,043	28.4
Bay of Plenty	280	4.6	81	5.2	122	4.0	74	4.1	48	3.8	483	4.5
Central Plateau	282	4.7	73	4.7	119	3.9	78	4.3	41	3.2	474	4.4
Western Uplands	53	0.9	6	0.4	28	0.9	15	0.8	13	1.0	87	0.8
East Coast	6	0.1	2	0.1	1	0.0	0	0.0	1	0.1	9	0.1
Hawkes Bay	47	0.8	8	0.5	11	0.4	8	0.4	3	0.2	66	0.6
Taranaki	836	13.8	208	13.3	465	15.1	257	14.1	208	16.4	1,509	14.1
Manawatu	332	5.5	56	3.6	103	3.3	55	3.0	48	3.8	491	4.6
Wairarapa	220	3.6	71	4.5	91	3.0	51	2.8	40	3.2	382	3.6
<b>North Island</b>	<b>4,218</b>	<b>69.7</b>	<b>1,162</b>	<b>74.1</b>	<b>2,209</b>	<b>71.6</b>	<b>1,431</b>	<b>78.8</b>	<b>778</b>	<b>61.4</b>	<b>7,589</b>	<b>70.9</b>
Nelson/Marlborough	137	2.3	20	1.3	37	1.2	21	1.2	16	1.3	194	1.8
West Coast	258	4.3	29	1.8	70	2.3	34	1.9	36	2.8	357	3.3
North Canterbury	503	8.3	147	9.4	229	7.4	97	5.3	132	10.4	879	8.2
South Canterbury	185	3.1	27	1.7	98	3.2	32	1.8	66	5.2	310	2.9
Otago	230	3.8	47	3.0	141	4.6	54	3.0	87	6.9	418	3.9
Southland	520	8.6	136	8.7	300	9.7	148	8.1	152	12.0	956	8.9
<b>South Island</b>	<b>1,833</b>	<b>30.3</b>	<b>406</b>	<b>25.9</b>	<b>875</b>	<b>28.4</b>	<b>386</b>	<b>21.2</b>	<b>489</b>	<b>38.6</b>	<b>3,114</b>	<b>29.1</b>
<b>New Zealand</b>	<b>6,051</b>	<b>100.0</b>	<b>1,568</b>	<b>100.0</b>	<b>3,084</b>	<b>100.0</b>	<b>1,817</b>	<b>100.0</b>	<b>1,267</b>	<b>100.0</b>	<b>10,703</b>	



Table 3.10 shows the number and percentage of owner-operators, contract milkers and sharemilkers by herd size. Herds in the range of 200-249 animals (which represent 12.4% of herds nationally) account for the highest percentage of herds in each known operating structure category except 50/50 sharemilking. In the 2021/22 season, the highest percent of 50/50 sharemilkers were herds with 250-299 animals. Owner-operators of herds with a size of 200-249 were the most common operating structure overall, with 777 herds.

**Table 3.10: Operating structure by herd size in 2021/22**

<i>Herd size</i>	<i>Owner-operators</i>	<i>Owner-operators %</i>	<i>Contract milkers</i>	<i>Contract milkers %</i>	<i>All share-milkers</i>	<i>All share-milkers %</i>	<i>50/50 share-milkers</i>	<i>50/50 share-milkers %</i>	<i>Variable order share-milkers</i>	<i>Variable order share-milkers %</i>	<i>Number of herds (excl. unknown)</i>	<i>Percentage of herds</i>
10-49	4	0.1	0	0.0	0	0.0	0	0.0	0	0.0	4	0.0
50-99	120	2.0	2	0.1	18	0.6	6	0.3	12	0.9	140	1.3
100-149	379	6.3	16	1.0	92	3.0	46	2.5	46	3.6	487	4.6
150-199	628	10.4	86	5.5	276	8.9	179	9.9	97	7.7	990	9.2
200-249	777	12.8	177	11.3	370	12.0	240	13.2	130	10.3	1,324	12.4
250-299	580	9.6	172	11.0	346	11.2	243	13.4	103	8.1	1,098	10.3
300-349	540	8.9	159	10.1	325	10.5	212	11.7	113	8.9	1,024	9.6
350-399	393	6.5	134	8.5	252	8.2	155	8.5	97	7.7	779	7.3
400-449	418	6.9	140	8.9	234	7.6	149	8.2	85	6.7	792	7.4
450-499	294	4.9	89	5.7	172	5.6	97	5.3	75	5.9	555	5.2
500-549	285	4.7	111	7.1	165	5.4	92	5.1	73	5.8	561	5.2
550-599	211	3.5	95	6.1	125	4.1	74	4.1	51	4.0	431	4.0
600-649	209	3.5	75	4.8	147	4.8	72	4.0	75	5.9	431	4.0
650-699	171	2.8	44	2.8	82	2.7	44	2.4	38	3.0	297	2.8
700-749	148	2.4	39	2.5	89	2.9	43	2.4	46	3.6	276	2.6
750-799	116	1.9	39	2.5	54	1.8	21	1.2	33	2.6	209	2.0
800-849	134	2.2	33	2.1	78	2.5	38	2.1	40	3.2	245	2.3
850-899	77	1.3	25	1.6	36	1.2	21	1.2	15	1.2	138	1.3
900-949	88	1.5	20	1.3	40	1.3	16	0.9	24	1.9	148	1.4
950-999	74	1.2	21	1.3	24	0.8	7	0.4	17	1.3	119	1.1
1000-1099	133	2.2	25	1.6	56	1.8	26	1.4	30	2.4	214	2.0
1100-1199	79	1.3	23	1.5	26	0.8	11	0.6	15	1.2	128	1.2
1200-1499	111	1.8	26	1.7	49	1.6	16	0.9	33	2.6	186	1.7
1500+	82	1.4	17	1.1	28	0.9	9	0.5	19	1.5	127	1.2
<b>Total/Avg</b>	<b>6,051</b>	<b>100.0</b>	<b>1,568</b>	<b>100.0</b>	<b>3,084</b>	<b>100.0</b>	<b>1,817</b>	<b>100.0</b>	<b>1,267</b>	<b>100.0</b>	<b>10,703</b>	<b>100.0</b>

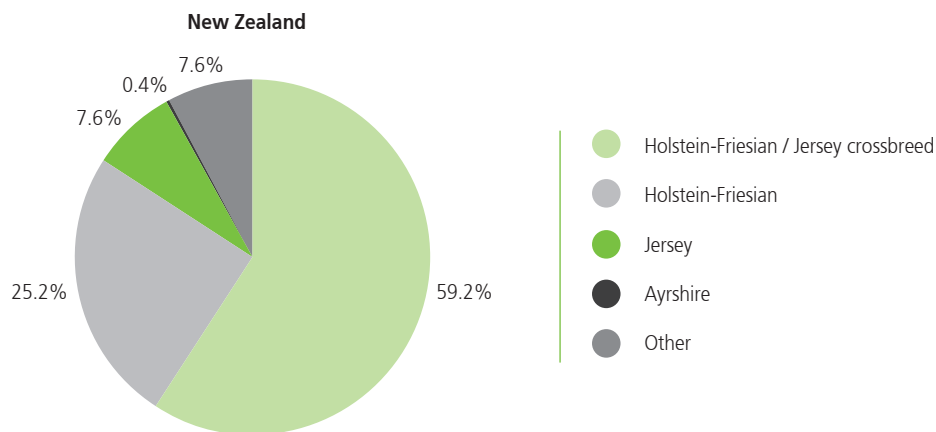
## D. Breed breakdown

Three breeds of dairy cattle dominate the dairy cow inseminations carried out in New Zealand: Holstein-Friesian, Jersey, and Holstein-Friesian/Jersey crossbred. Historically, these insemination counts have been pulled from the LIC National Database. For the 2021/22 season (and going forward), counts are based on records in the Dairy Industry Good Animal Database (DIGAD). Breed categorisation has also changed to now match the AE breed classification used by New Zealand Animal Evaluation Limited (NZAE).

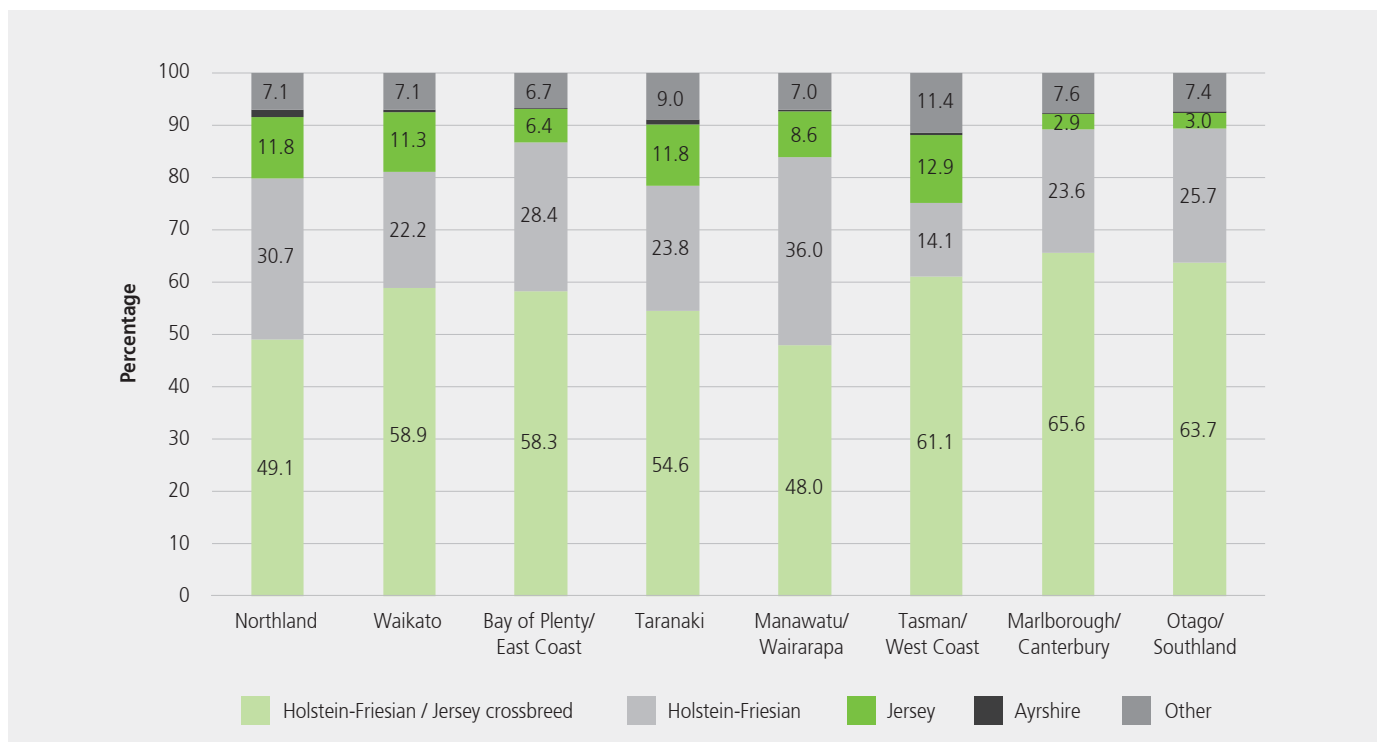
The Jersey breed dominated the national dairy herd until the late 1960s. By 1970, Holstein-Friesian was the dominant dairy breed in New Zealand, because of changes in farm management practices and farmers choosing to raise larger numbers of dairy calves for beef. Holstein-Friesian/Jersey Crossbred now makes up a large proportion of the national dairy herd.

The percentages of the major dairy breed categories for New Zealand and each region are shown in Graphs 3.2 and 3.3. Percentages are given for Holstein-Friesian, Jersey, Holstein-Friesian/Jersey crossbred and Ayrshire cows, with the remaining breeds and crossbreeds grouped into "Other". Holstein-Friesian/Jersey crossbred is the prevalent breed category in all regions. The Manawatu/Wairarapa region continues to have the highest percentage of Holstein-Friesian cows (36.0%) followed by Northland (30.7%). Tasman/West Coast has the highest proportion of Jerseys (12.9%) followed by Taranaki and Northland (both at 11.8%). Marlborough/Canterbury has the highest proportion of Holstein-Friesian/Jersey crossbreds (65.6%), followed by Otago/Southland (63.7%).

Graph 3.2: Breed category percentages of cows for New Zealand in 2021/22



Graph 3.3: Breed category percentages of cows by region in 2021/22



## 4. Herd improvement

### A. Use of herd testing

Herd testing enables farmers to collect information about individual cows in their herds. The information gained from herd testing is vital for effective herd management and decision-making. Farmers are able to benchmark animal performance within herd, within region, and nationally.

Farmers currently have the choice of two herd testing service providers (CRV AmBreed and LIC), and are able to choose the frequency of testing. Data used in the following analysis includes figures from both herd test providers. However, for the 2021/22 season, some CRV data was unavailable for certain tables (4.3-4.6, 4.22) and graphs (4.2) and therefore may be under-represented in these statistics.

Herd testing involves the collection of individual milk samples from animals in the herd. A full herd test provides information on milk volumes, milkfat and protein yields, and somatic cell counts.

Herd testing provides an overall picture of the production of the herd, and enables the mastitis status to be monitored. More specifically, herd test information identifies low-producing cows (for removal from the herd or drying off), high producers (for breeding), and cows with mastitis (for therapy or removal from the herd).

- **78% of cows were herd-tested in 2021/22**

Both the percentage of total herds, and the percentage of total cows using herd testing at least once during the season, increased in 2021/22 (Table 4.1). The percentage of herds testing (75.9%) in 2021/22, was approximately 14.5% higher than in 2015/16 and the second highest it has been in the past 18 seasons. A total of 3.79 million cows were herd-tested in 2021/22, representing 78.3% of total cows being herd-tested - a new record high.

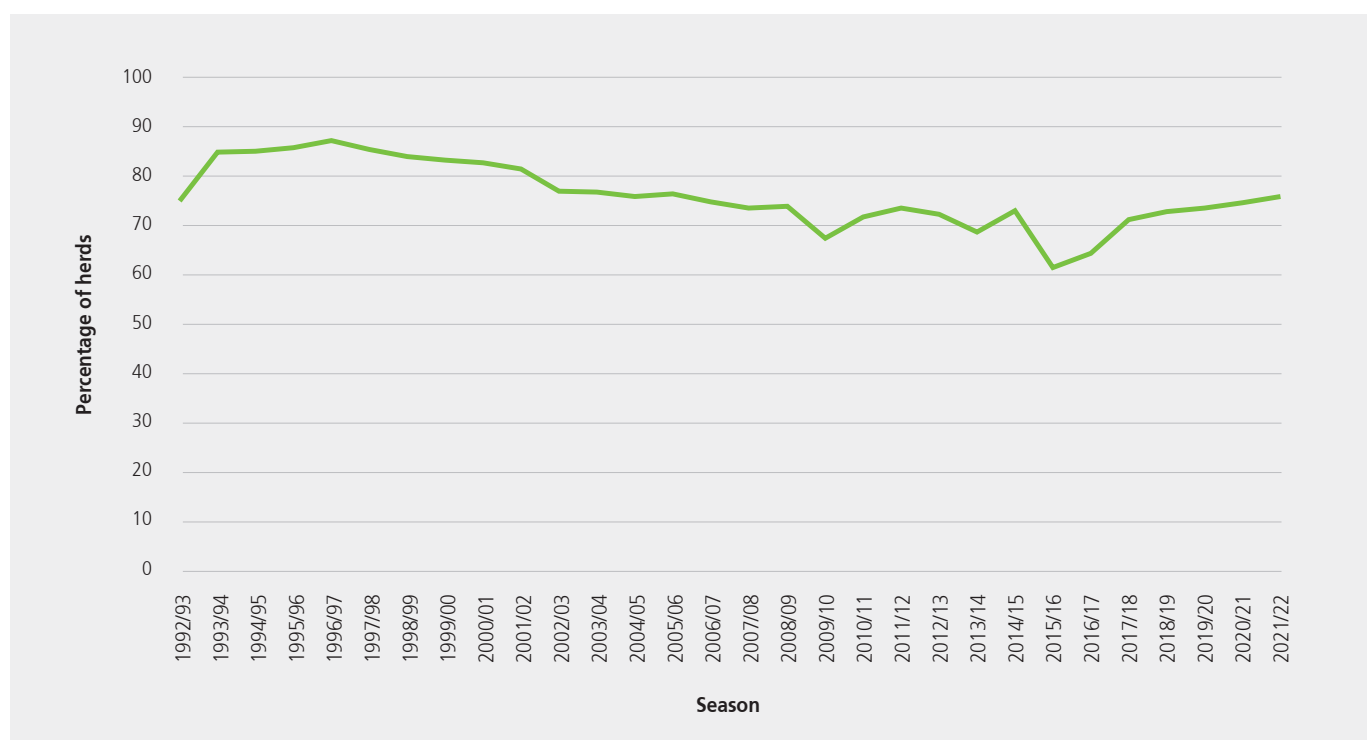
**Table 4.1: Trend in the use of herd testing services for the last 20 seasons**

Season	Number of herds herd-tested	Total herds	% of total herds herd-tested	Number of cows herd-tested (000)	Total cows (000)	% of total cows herd-tested
2002/03	10,113	13,140	77.0	2,855	3,741	76.3
2003/04	9,772	12,751	76.6	2,842	3,851	73.8
2004/05	9,306	12,271	75.8	2,811	3,868	72.7
2005/06	9,082	11,883	76.4	2,846	3,832	74.3
2006/07	8,692	11,630	74.7	2,791	3,917	71.2
2007/08	8,405	11,436	73.5	2,871	4,013	71.5
2008/09	8,589	11,618	73.9	3,040	4,253	71.5
2009/10	7,870	11,691	67.3	2,812	4,397	64.0
2010/11	8,409	11,735	71.7	3,186	4,529	70.4
2011/12	8,673	11,798	73.5	3,362	4,634	72.6
2012/13	8,585	11,891	72.2	3,426	4,784	71.6
2013/14	8,188	11,927	68.7	3,294	4,923	66.9
2014/15	8,724	11,970	72.9	3,654	5,018	72.8
2015/16	7,316	11,908	61.4	3,030	4,998	60.6
2016/17	7,557	11,748	64.3	3,206	4,861	65.9
2017/18	8,242	11,590	71.1	3,615	4,993	72.4
2018/19	8,280	11,372	72.8	3,672	4,946	74.2
2019/20	8,212	11,179	73.5	3,689	4,922	75.0
2020/21	8,218	11,034	74.5	3,735	4,904	76.2
2021/22*	8,191	10,796	75.9	3,790	4,842	78.3

\* From 2021/22 onwards, herds with fewer than 50 herd tested animals are no longer counted.

The trend in the percentage of total herds using herd testing shows an increase over the past six seasons, rising to the levels that were last seen in 2004-05 and 2006-07 (Graph 4.1).

**Graph 4.1: Trend in the percentage of herds testing for the last 30 seasons**



The regional uptake of herd testing services in 2021/22 is shown in Table 4.2, where the number of cows tested refers to all cows tested at least once in the season. All regions recorded between 63 and 81 percent of herds testing (with the exception of East Coast). Wairarapa had the highest percentage of herds using herd testing (81.3%), closely followed by North Canterbury (81.2%). Wairarapa and Taranaki had the highest percentage of cows herd tested (82.7%).

**Table 4.2: Use of herd testing by region in 2021/22**

Farming Region	Herds tested	Total herds	Percentage of total herds	Cows tested	Total cows	Percentage of total cows	Average herd size tested	Average herd size
Northland	516	737	70.0	188,746	243,014	77.7	366	330
Auckland	204	322	63.4	66,863	93,597	71.4	328	291
Waikato	2,309	3,051	75.7	849,146	1,081,321	78.5	368	354
Bay of Plenty	358	491	72.9	132,589	178,646	74.2	370	364
Central Plateau	338	476	71.0	185,222	281,556	65.8	548	592
Western Uplands	57	87	65.5	29,731	47,506	62.6	522	546
East Coast	4	9	44.4	1,989	4,938	40.3	497	549
Hawkes Bay	50	66	75.8	35,678	44,139	80.8	714	669
Taranaki	1,221	1,515	80.6	380,426	460,243	82.7	312	304
Manawatu	342	492	69.5	162,174	210,308	77.1	474	427
Wairarapa	314	386	81.3	122,578	148,169	82.7	390	384
Nelson/Marlborough	149	195	76.4	57,006	73,659	77.4	383	378
West Coast	270	357	75.6	108,604	147,082	73.8	402	412
North Canterbury	714	879	81.2	593,289	720,520	82.3	831	820
South Canterbury	242	310	78.1	190,868	245,184	77.8	789	791
Otago	345	443	77.9	220,853	270,611	81.6	640	611
Southland	758	980	77.3	464,777	591,629	78.6	613	604
<b>New Zealand</b>	<b>8,191</b>	<b>10,796</b>	<b>75.9</b>	<b>3,790,539</b>	<b>4,842,122</b>	<b>78.3</b>	<b>463</b>	<b>449</b>

Note: Table includes figures from both herd test providers.

## B. Herd test averages

The lactation yield figures in this section are for herd-tested cows. Seasonal and breed averages (parts i and iii) are calculated on lactation yields for herds tested four or more times during the season. Monthly averages (part ii) are calculated on lactation yields for herds tested at least once during the season, and only cows that lactated for 100 or more days were included in the herd test averages. These figures are different to the average milksolids figures given in Chapters 2 and 3 (national and regional dairy statistics, respectively), which were based on all herds supplying a dairy company (regardless of whether herd testing was used) and represented the average production per cow as supplied to the dairy company.

Days-in-milk (herd testing) information is the number of days from the start of lactation to the calculated end of lactation. The start of lactation is four days from calving (with a maximum of 60 days between the estimated start of lactation and the first herd test). The end of lactation is the last herd test date plus 15 days. The inclusion of herds with fewer than four tests reduces the calculated average lactation length: therefore, the number of days-in-milk, calculated using this method, does not necessarily reflect the average lactation length of dairy cows.

The days-in-milk (production) figure is the number of days from the estimated start of lactation to the estimated end of lactation (reported since 1997/98). The results are derived from seasonal supplier tanker pick-up information, adjusted for calving spread. The days-in-milk (production) methodology provides a more accurate measure of the average lactation length of dairy cows than the herd-testing methodology.

### i) Seasonal averages

- Southland had the highest milksolids production (kg/cow)
- Southland and North Canterbury had the highest milkfat (kg/cow)
- Southland, Otago and North Canterbury had the highest protein (kg/cow)
- West Coast had the highest milkfat, protein and milksolids percentages

The average per-cow statistics for each region are summarised in Table 4.3. North Canterbury again recorded the highest figure per cow for milk volume (4,967 litres), however, Southland recorded the highest figure per cow for milksolids (428 kg). West Coast recorded the highest percentage for milkfat (5.06%), protein (3.98%) and milksolids (9.04%). Herds in North Canterbury recorded the lowest average somatic cells (156,000 cells/ml).

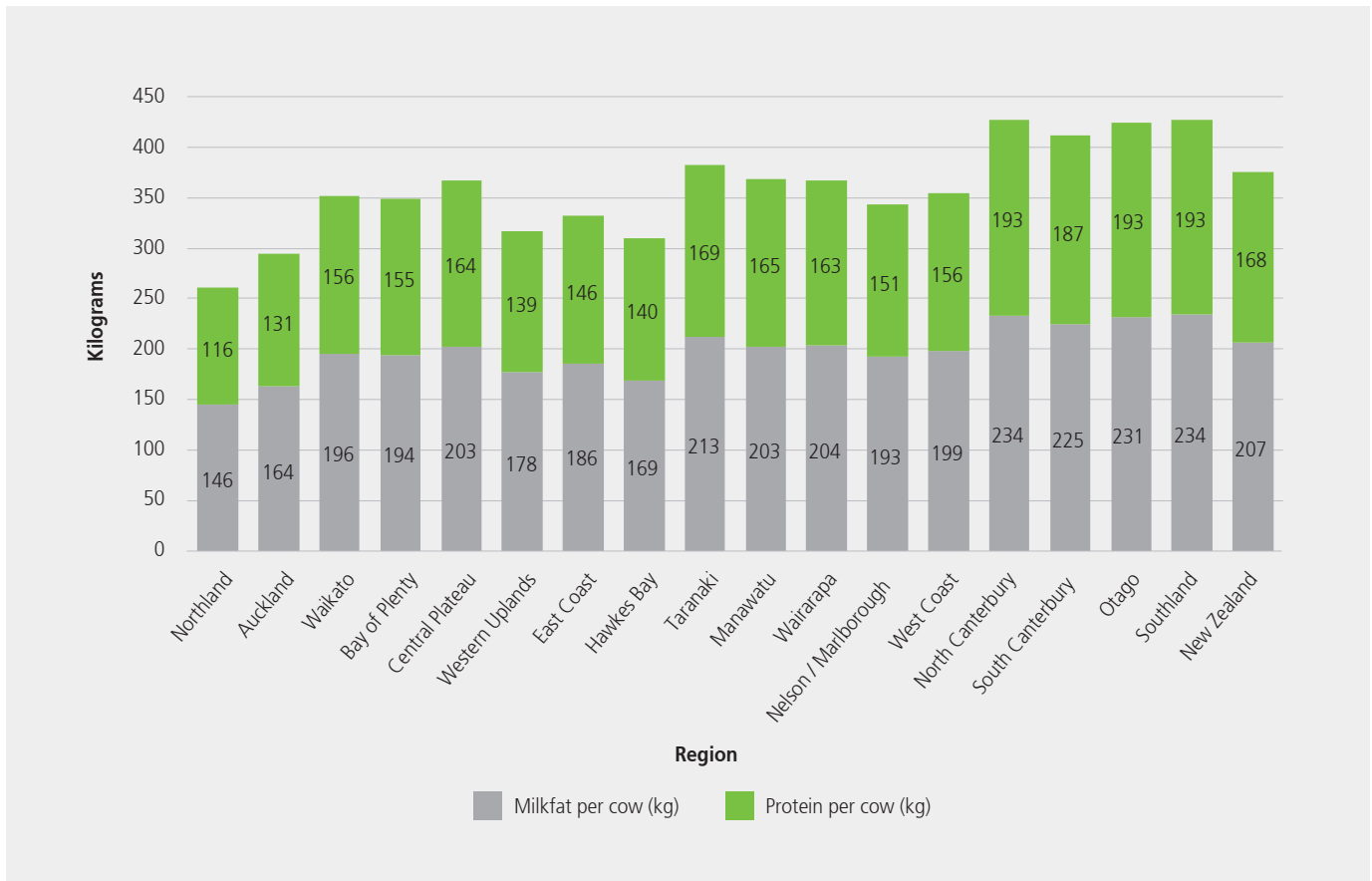
**Table 4.3: Season herd test averages per cow by region in 2021/22**

Region	Milk (litres)	Milkfat (kg)	Milkfat (%)	Protein (kg)	Protein (%)	Milksolids (kg)	Milksolids (%)	Days in milk (herd testing)	Days in milk (production)	Somatic cell count (000 cells/ millilitre)
Northland	3,101	146	4.71	116	3.73	262	8.44	182	274	224
Auckland	3,531	164	4.64	131	3.72	295	8.36	183	277	199
Waikato	4,101	196	4.77	156	3.80	352	8.58	217	273	177
Bay of Plenty	4,085	194	4.75	155	3.79	349	8.53	223	273	205
Central Plateau	4,293	203	4.73	164	3.82	367	8.55	226	274	187
Western Uplands	3,577	178	4.97	139	3.89	317	8.86	223	269	196
East Coast	3,715	186	5.00	146	3.94	332	8.93	222	281	255
Hawkes Bay	3,676	169	4.59	140	3.82	309	8.41	192	273	243
Taranaki	4,344	213	4.90	169	3.90	382	8.80	221	273	176
Manawatu	4,379	203	4.64	165	3.76	368	8.40	210	280	220
Wairarapa	4,234	204	4.82	163	3.86	368	8.68	227	277	208
Nelson/Marlborough	3,893	193	4.96	151	3.87	344	8.82	226	273	191
West Coast	3,920	199	5.06	156	3.98	354	9.04	222	269	181
North Canterbury	4,967	234	4.71	193	3.89	427	8.60	230	283	156
South Canterbury	4,766	225	4.72	187	3.91	411	8.63	222	282	159
Otago	4,876	231	4.74	193	3.95	424	8.69	230	272	159
Southland	4,906	234	4.77	193	3.94	428	8.71	229	272	162
<b>New Zealand</b>	<b>4,350</b>	<b>207</b>	<b>4.77</b>	<b>168</b>	<b>3.86</b>	<b>375</b>	<b>8.63</b>	<b>219</b>	<b>274</b>	<b>178</b>

**Note:** For the 2021/22 season, this table is based on LIC Herd Improvement Database and does not include all CRV HT results.

The 2021/22 milkfat and protein lactation regional averages for herd-tested cows (Graph 4.2) show some variability in figures among regions. Southland and North Canterbury recorded the highest milkfat per cow (234 kg), with Otago joining them for the highest protein per cow (193 kg). At the other end of the scale, Northland recorded the lowest milkfat and protein per cow (146 and 116 kg respectively), followed by Auckland (164 and 131 kg respectively).

**Graph 4.2: Average milkfat and protein production per cow by region in 2021/22**





- *Herd test averages for milksolids (kg) decreased*
- *Somatic cell count average, up from the previous three seasons*

Milk production (litres) per cow for 2021/22 decreased on the previous three seasons (Table 4.4). Milksolids also decreased from 385 kilograms in 2020/21 to 375 in 2021/22. The percentage of milksolids increased (0.01%) compared with 2020/21, with milkfat percentages also seeing a slight increase while protein dropped in comparison with the previous season.

The average herd somatic cell count increased to 178,000 cells/millilitre for 2021/22. Average days in milk (production) at 290 in 2021/22, increased on the previous season.

**Table 4.4: Trend in the national herd test averages for the last 20 seasons**

Season	Milk (litres)	Milkfat (kg)	Milkfat (%)	Protein (kg)	Protein (%)	Milksolids (kg)	Milksolids (%)	Days in milk (herd testing)	Days in milk (production)	Somatic cell count (000 cells/ millilitre)
2002/03	3,736	175	4.68	138	3.66	313	8.38	219	-	213
2003/04	3,871	184	4.75	142	3.64	326	8.42	224	265	220
2004/05	3,812	181	4.75	140	3.66	321	8.42	225	265	229
2005/06	3,951	186	4.72	146	3.68	332	8.40	227	266	213
2006/07	4,014	191	4.85	150	3.76	341	8.50	230	267	232
2007/08	3,987	187	4.68	148	3.70	334	8.38	225	252	246
2008/09	4,043	190	4.70	150	3.72	340	8.42	228	266	253
2009/10	4,097	194	4.73	154	3.76	348	8.48	227	260	235
2010/11	4,101	194	4.73	154	3.75	348	8.48	229	274	232
2011/12	4,409	210	4.77	167	3.80	378	8.56	235	275	204
2012/13	4,386	207	4.72	166	3.79	373	8.51	227	258	204
2013/14	4,480	212	4.74	170	3.80	383	8.54	229	266	187
2014/15	4,379	209	4.78	168	3.84	378	8.63	226	273	182
2015/16	4,311	204	4.73	165	3.84	369	8.57	225	276	187
2016/17	4,323	206	4.77	167	3.87	374	8.64	229	276	183
2017/18	4,217	201	4.75	161	3.82	362	8.57	219	274	185
2018/19	4,359	206	4.72	167	3.84	373	8.56	218	271	175
2019/20	4,371	207	4.74	169	3.87	376	8.61	216	268	173
2020/21	4,462	212	4.75	173	3.87	385	8.62	220	276	170
2021/22 <sup>a</sup>	4,350	207	4.77	168	3.86	375	8.63	219	290	178

- Not available

<sup>a</sup> Season averages do not include all CRV HT data, except for DIM production

## ii) Monthly averages

- *Peak milk in September-October*

The seasonal average figures presented in Table 4.5 are calculated using national monthly herd test averages, and are therefore affected by the number of samples processed. Statistics for May, June, and July are based on far fewer cows than the statistics for the other months, as only a few herds (generally winter milk herds) test in these months. Differences in climate between regions (which in turn can affect the mating period), available feed, and cow condition are reflected in differing months of peak production.

All cows herd tested in each month were included, provided they were tested at least once during the season (Table 4.5). Average peak cow production occurs between August and October, with most regions reaching peak production in September or October.

**Table 4.5: Monthly herd test averages by region in 2021/22**

### Average litres of milk per cow per day

Farming region	2021 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2022 Jan	Feb	Mar	Apr	May	Season average
Northland	18.74	18.32	19.75	19.51	18.86	16.51	14.57	12.38	11.44	9.64	10.46	15.46	15.18
Auckland	19.62	21.68	19.82	22.03	21.43	19.39	16.48	13.82	13.10	11.63	11.16	17.07	17.17
Waikato	20.36	20.23	21.95	23.38	22.62	19.78	17.65	14.80	13.05	11.73	10.94	15.45	17.33
Bay of Plenty	22.15	20.59	23.53	22.92	21.53	19.74	17.81	13.99	13.30	11.09	10.38	12.29	16.80
Central Plateau	18.67	21.79	23.05	22.65	24.44	21.08	19.25	15.81	13.52	13.33	12.82	12.60	18.02
Western Uplands	12.74	8.78	19.93	21.32	20.44	17.23	16.44	12.11	11.76	10.43	10.38	9.31	15.08
East Coast	-	-	-	20.80	-	17.92	17.25	14.37	-	10.06	7.95	-	14.38
Hawkes Bay	13.46	18.18	20.48	21.90	24.70	19.08	18.88	16.43	14.69	14.34	12.46	15.31	18.08
Taranaki	21.79	21.00	23.38	23.94	23.55	21.11	18.53	17.06	14.73	14.06	12.06	14.89	18.30
Manawatu	19.10	19.34	23.19	24.65	23.94	22.03	20.51	17.86	16.30	15.87	14.42	14.98	19.39
Wairarapa	18.15	16.80	20.54	22.07	22.80	20.42	18.64	16.43	14.53	14.28	12.11	12.59	17.39
Nelson/Marlborough	16.66	14.47	-	21.66	23.12	20.75	18.03	16.43	13.91	12.10	12.26	10.48	16.70
West Coast	18.83	13.89	-	21.62	21.53	19.83	18.05	15.51	14.01	12.59	10.65	10.57	16.18
North Canterbury	19.03	20.95	20.75	24.83	25.57	23.36	21.30	20.02	18.07	16.01	14.40	13.22	19.92
South Canterbury	20.24	20.21	22.98	24.68	25.60	23.08	21.05	19.42	17.58	15.84	14.07	12.02	19.58
Otago	16.56	16.33	-	24.72	24.95	23.27	21.07	19.40	17.38	15.42	12.25	12.47	19.28
Southland	13.93	16.76	20.72	25.42	25.62	24.59	22.19	20.82	18.40	16.27	13.06	12.67	20.19
<b>New Zealand<sup>1</sup></b>	<b>19.45</b>	<b>19.60</b>	<b>21.63</b>	<b>23.48</b>	<b>24.00</b>	<b>21.14</b>	<b>19.44</b>	<b>17.19</b>	<b>15.47</b>	<b>13.91</b>	<b>12.47</b>	<b>13.65</b>	<b>18.36</b>

### Average kg of milkfat per cow per day

Farming region	2021 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2022 Jan	Feb	Mar	Apr	May	Season average
Northland	0.86	0.86	0.95	0.92	0.88	0.80	0.70	0.63	0.60	0.55	0.60	0.78	0.76
Auckland	0.89	0.96	0.90	1.01	0.97	0.89	0.77	0.68	0.66	0.64	0.64	0.88	0.84
Waikato	0.99	0.98	1.05	1.09	1.05	0.94	0.84	0.74	0.69	0.67	0.65	0.84	0.88
Bay of Plenty	0.99	1.01	1.06	1.06	0.99	0.92	0.84	0.70	0.69	0.63	0.61	0.68	0.84
Central Plateau	0.85	0.95	1.06	1.05	1.10	0.98	0.90	0.78	0.71	0.73	0.72	0.72	0.89
Western Uplands	0.86	0.61	1.01	1.02	0.97	0.82	0.80	0.63	0.65	0.60	0.61	0.57	0.79
East Coast	-	-	-	1.02	-	0.87	0.65	0.75	-	0.60	0.48	-	0.76
Hawkes Bay	0.66	0.91	0.99	0.99	1.09	0.88	0.89	0.78	0.74	0.76	0.69	0.78	0.88
Taranaki	1.06	1.03	1.12	1.13	1.10	1.02	0.92	0.87	0.80	0.80	0.72	0.83	0.94
Manawatu	0.95	0.93	1.09	1.13	1.07	1.01	0.95	0.85	0.82	0.85	0.77	0.81	0.94
Wairarapa	0.88	0.84	0.96	1.04	1.05	0.97	0.91	0.82	0.78	0.78	0.70	0.71	0.89
Nelson/Marlborough	0.84	0.73	-	1.02	1.07	0.97	0.88	0.80	0.75	0.68	0.72	0.62	0.86
West Coast	1.07	0.82	-	1.04	1.00	0.96	0.89	0.79	0.77	0.70	0.68	0.69	0.86
North Canterbury	0.98	0.98	0.96	1.11	1.15	1.07	1.01	0.96	0.92	0.85	0.81	0.75	0.99
South Canterbury	0.95	0.92	1.10	1.12	1.14	1.07	1.00	0.94	0.90	0.85	0.79	0.70	0.98
Otago	0.87	0.89	-	1.12	1.12	1.08	0.98	0.95	0.89	0.84	0.72	0.74	0.97
Southland	0.81	0.88	1.04	1.17	1.14	1.13	1.03	1.00	0.94	0.89	0.79	0.77	1.02
<b>New Zealand<sup>1</sup></b>	<b>0.93</b>	<b>0.94</b>	<b>1.03</b>	<b>1.09</b>	<b>1.09</b>	<b>0.99</b>	<b>0.92</b>	<b>0.85</b>	<b>0.81</b>	<b>0.77</b>	<b>0.73</b>	<b>0.78</b>	<b>0.92</b>

### Average kg of protein per cow per day

<i>Farming region</i>	<i>2021 Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>2022 Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Season average</i>
Northland	0.70	0.71	0.77	0.75	0.72	0.63	0.55	0.48	0.46	0.42	0.46	0.62	0.60
Auckland	0.73	0.81	0.75	0.84	0.80	0.73	0.62	0.52	0.51	0.49	0.49	0.69	0.67
Waikato	0.80	0.81	0.86	0.90	0.86	0.75	0.66	0.56	0.52	0.51	0.50	0.66	0.69
Bay of Plenty	0.84	0.78	0.89	0.87	0.81	0.74	0.66	0.53	0.53	0.48	0.47	0.56	0.66
Central Plateau	0.74	0.86	0.86	0.86	0.92	0.79	0.71	0.60	0.53	0.57	0.58	0.58	0.71
Western Uplands	0.61	0.45	0.79	0.82	0.78	0.66	0.62	0.48	0.47	0.46	0.48	0.45	0.61
East Coast	-	-	-	0.79	-	0.69	0.58	0.59	-	0.46	0.39	-	0.60
Hawkes Bay	0.53	0.73	0.83	0.84	0.94	0.73	0.71	0.62	0.59	0.61	0.56	0.66	0.72
Taranaki	0.85	0.83	0.91	0.92	0.91	0.83	0.72	0.67	0.60	0.61	0.55	0.65	0.74
Manawatu	0.76	0.77	0.90	0.93	0.90	0.83	0.77	0.68	0.63	0.66	0.63	0.65	0.76
Wairarapa	0.72	0.66	0.80	0.84	0.87	0.78	0.71	0.64	0.59	0.61	0.55	0.57	0.70
Nelson/Marlborough	0.70	0.56	-	0.82	0.87	0.78	0.69	0.63	0.56	0.53	0.56	0.49	0.68
West Coast	0.84	0.68	-	0.84	0.81	0.77	0.69	0.62	0.58	0.55	0.51	0.52	0.67
North Canterbury	0.78	0.80	0.78	0.93	0.97	0.89	0.83	0.80	0.74	0.69	0.66	0.62	0.81
South Canterbury	0.76	0.72	0.91	0.94	0.98	0.89	0.81	0.77	0.73	0.69	0.65	0.57	0.80
Otago	0.66	0.70	-	0.95	0.96	0.90	0.82	0.77	0.72	0.67	0.58	0.59	0.80
Southland	0.63	0.69	0.85	0.97	0.97	0.94	0.87	0.83	0.76	0.71	0.62	0.61	0.83
<b>New Zealand<sup>1</sup></b>	<b>0.76</b>	<b>0.77</b>	<b>0.84</b>	<b>0.90</b>	<b>0.91</b>	<b>0.81</b>	<b>0.74</b>	<b>0.67</b>	<b>0.62</b>	<b>0.60</b>	<b>0.57</b>	<b>0.62</b>	<b>0.74</b>

### Average somatic cell count (000 cells per millilitre)

<i>Farming region</i>	<i>2021 Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>2022 Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Season average</i>
Northland	205	227	184	176	184	186	234	252	259	283	290	246	224
Auckland	185	219	158	175	167	172	195	208	259	234	241	189	199
Waikato	226	210	186	148	149	142	169	182	209	207	210	228	177
Bay of Plenty	226	148	230	173	174	178	184	216	239	234	254	227	205
Central Plateau	203	199	204	157	160	159	174	198	210	226	213	232	187
Western Uplands	116	153	186	156	160	150	201	160	241	222	251	206	196
East Coast	-	-	-	160	-	259	217	214	-	198	402	-	255
Hawkes Bay	220	247	242	202	200	227	246	209	288	266	293	306	243
Taranaki	206	199	200	164	152	149	165	168	200	198	205	216	176
Manawatu	286	237	253	190	203	183	217	215	262	219	242	240	220
Wairarapa	264	217	247	205	177	168	194	195	243	224	234	226	208
Nelson/Marlborough	151	232	-	176	166	150	150	205	206	195	228	262	191
West Coast	304	398	-	180	151	158	158	182	179	213	205	233	181
North Canterbury	220	239	192	155	148	142	146	156	158	153	166	188	156
South Canterbury	231	195	191	169	148	154	139	166	159	160	172	173	159
Otago	166	216	-	162	146	153	140	155	154	163	190	183	159
Southland	267	318	255	166	159	151	138	158	152	165	187	194	162
<b>New Zealand<sup>1</sup></b>	<b>220</b>	<b>226</b>	<b>195</b>	<b>162</b>	<b>158</b>	<b>155</b>	<b>165</b>	<b>179</b>	<b>193</b>	<b>194</b>	<b>204</b>	<b>210</b>	<b>178</b>

<sup>1</sup> Volume weighted averages

### iii) Breed category averages

- *Holstein-Friesian cows produce highest litres and milksolids (kg) production*

Herd test statistics by breed category (Table 4.6) include cows that were herd tested four or more times during the season. This data was extracted from the LIC Herd Improvement Database. For the 2021/22 season this does not include all relevant HT records from other (CRV) HT providers.

On average, Holstein-Friesian cows produced a higher volume of milk than other breeds. This season they also produced the highest protein (171.8kg) and milksolids (375.8kg). Jerseys have the highest milkfat and protein percentages (5.57% and 4.16% respectively).

In 2021/22, the age group that produced the highest milksolids (kg) across all breeds were the six-year-olds. This is similar to the 2019/20 which also saw six-year-old cows, across all breeds, produce more milksolids than the other ages. This is also a partial flow-on from the previous season (2020/21) which saw five-year-old Holstein-Friesian and Jersey among the greater milksolid-producing age groups.

A crossbreed is defined as having at most 13/16 of any one breed. For example, a Holstein-Friesian/Jersey crossbreed may be 13/16 Holstein-Friesian, 2/16 Jersey and 1/16 Ayrshire.

*Table 4.6: Herd test averages by breed category and cow age in 2021/22*

#### Holstein-Friesian

Age	Cows tested	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	174,077	226	3,611	167.3	137.6	304.9	4.67	3.82	8.50
3	168,219	222	4,415	197.8	168.2	366.0	4.52	3.82	8.35
4	145,758	220	4,870	217.2	184.2	401.4	4.50	3.79	8.29
5	121,640	218	5,003	222.1	188.7	410.8	4.47	3.78	8.26
6	102,199	217	5,077	224.8	190.3	415.1	4.46	3.76	8.22
7	75,072	215	4,972	219.7	185.3	405.0	4.45	3.74	8.19
8	46,096	213	4,847	213.9	178.7	392.7	4.44	3.70	8.14
9	31,201	210	4,683	207.2	171.3	378.5	4.46	3.67	8.13
10+	32,885	205	4,257	189.5	154.5	344.0	4.48	3.64	8.12
<b>Total</b>	<b>897,147</b>	<b>219</b>	<b>4,560</b>	<b>204.1</b>	<b>171.8</b>	<b>375.8</b>	<b>4.52</b>	<b>3.78</b>	<b>8.30</b>

#### Jersey

Age	Cows tested	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	46,579	227	2,678	150.5	110.7	261.2	5.65	4.15	9.80
3	41,920	223	3,193	176.8	133.1	309.9	5.56	4.18	9.74
4	37,231	224	3,522	196.5	147.7	344.2	5.61	4.21	9.82
5	32,492	222	3,587	198.9	149.8	348.7	5.57	4.19	9.76
6	26,530	220	3,614	200.4	150.6	350.9	5.57	4.18	9.75
7	21,904	218	3,559	195.4	147.3	342.7	5.51	4.15	9.67
8	15,231	216	3,487	192.5	143.9	336.4	5.55	4.14	9.69
9	11,226	213	3,372	183.8	138.1	322.0	5.48	4.11	9.59
10+	12,069	208	3,107	168.0	125.6	293.6	5.43	4.05	9.48
<b>Total</b>	<b>245,182</b>	<b>221</b>	<b>3,298</b>	<b>182.8</b>	<b>137.0</b>	<b>319.7</b>	<b>5.57</b>	<b>4.16</b>	<b>9.74</b>

### Holstein-Friesian/Jersey crossbreed

Age	Cows tested	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	327,025	227	3,354	168.7	133.4	302.1	5.07	3.99	9.05
3	294,776	223	4,069	198.7	162.0	360.6	4.92	3.99	8.91
4	249,000	222	4,477	219.7	178.1	397.9	4.95	3.99	8.94
5	210,778	222	4,631	226.4	183.7	410.1	4.93	3.98	8.91
6	168,405	219	4,656	228.3	183.9	412.2	4.94	3.96	8.90
7	136,490	218	4,556	225.0	180.0	405.0	4.97	3.96	8.94
8	91,804	215	4,489	220.3	175.4	395.7	4.94	3.92	8.86
9	58,016	213	4,316	210.3	167.1	377.4	4.91	3.88	8.79
10+	60,385	207	3,962	192.9	151.2	344.1	4.90	3.83	8.73
<b>Total</b>	<b>1,596,679</b>	<b>221</b>	<b>4,193</b>	<b>206.3</b>	<b>165.9</b>	<b>372.2</b>	<b>4.96</b>	<b>3.97</b>	<b>8.93</b>

### Ayrshire

Age	Cows tested	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	2,239	234	3,391	148.4	119.9	268.3	4.40	3.54	7.94
3	1,939	230	3,991	172.8	142.6	315.4	4.35	3.57	7.92
4	1,695	228	4,371	188.4	155.6	344.0	4.32	3.56	7.88
5	1,487	230	4,610	198.1	164.9	362.9	4.32	3.58	7.90
6	1,197	230	4,703	200.7	167.9	368.6	4.30	3.57	7.87
7	1,113	227	4,658	199.1	165.3	364.5	4.30	3.56	7.85
8	790	223	4,615	198.4	163.2	361.6	4.32	3.54	7.87
9	527	221	4,365	185.7	154.4	340.1	4.26	3.54	7.79
10+	836	217	4,002	171.2	140.5	311.7	4.30	3.52	7.83
<b>Total</b>	<b>11,823</b>	<b>229</b>	<b>4,204</b>	<b>181.1</b>	<b>149.4</b>	<b>330.5</b>	<b>4.33</b>	<b>3.56</b>	<b>7.89</b>

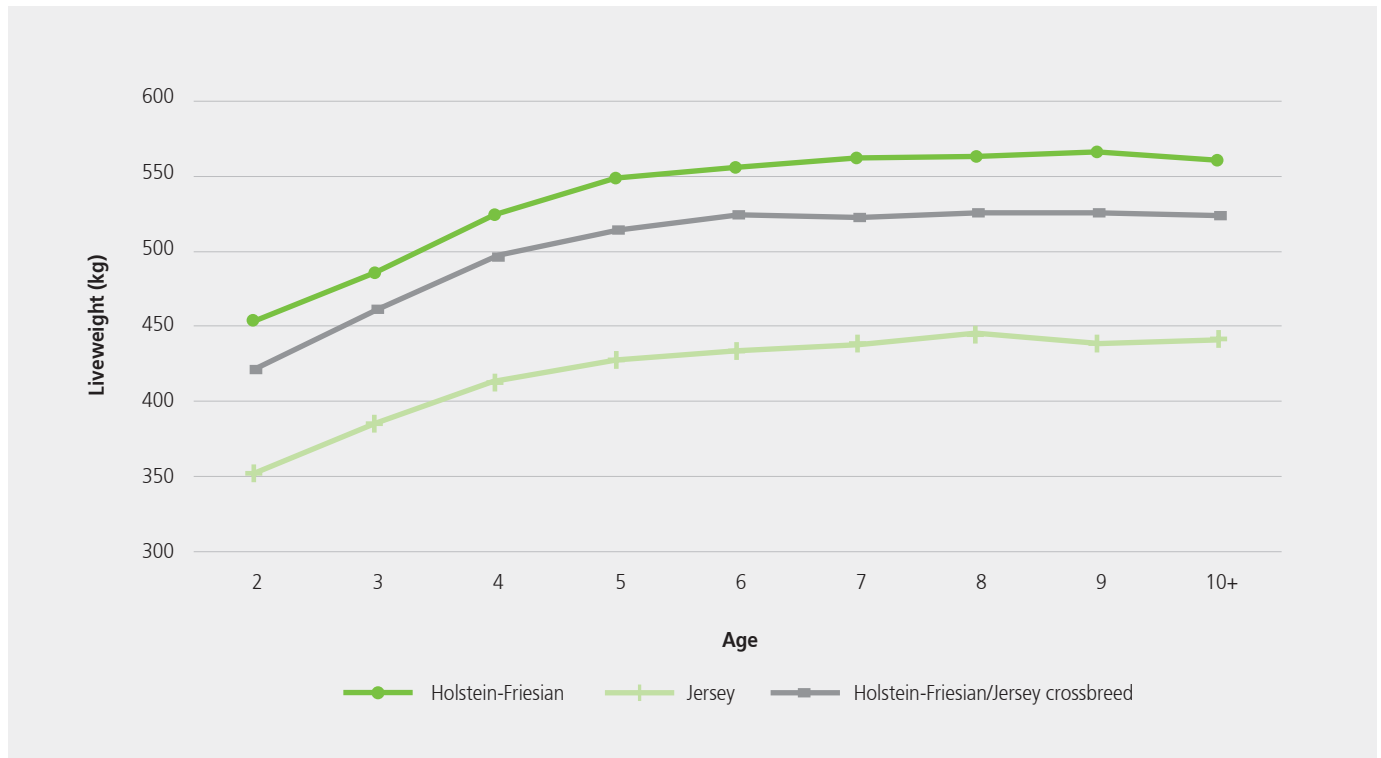
In the past, liveweight averages for the three main breeds have been calculated based on records in the LIC Herd Improvement Database. For the 2021/22 season, these calculations are based on records in the Dairy Industry Good Animal Database (DIGAD). Breed categorisation has also changed to now match AE breed classification.

Amongst the breeds shown in Table 4.7, Holstein-Friesians have the highest average liveweight across all ages. In contrast, Jerseys have the lowest average liveweight across all ages. Liveweight by age and breed is illustrated in Graph 4.3.

**Table 4.7: Liveweight by age and by breed category of cow in 2021/22**

Age	Holstein-Friesian		Jersey		Holstein-Friesian/Jersey crossbreed	
	Average liveweight (kg)	Number of cows	Average liveweight (kg)	Number of cows	Average liveweight (kg)	Number of cows
2	454	9,017	351	4,477	421	37,618
3	486	1,511	385	902	461	6,530
4	525	1,313	413	712	497	5,243
5	550	1,024	427	551	514	4,263
6	556	969	435	463	525	3,286
7	562	669	438	298	522	2,452
8	563	394	445	207	526	1,493
9	566	253	438	155	526	931
10+	561	265	442	139	523	886
<b>Weighted Avg</b>	<b>518</b>		<b>407</b>		<b>486</b>	

Graph 4.3: Liveweight by age and by breed category of cow in 2021/22



## C. Artificial Breeding (AB) statistics

- 3.94 million cows to AB in 2021/22
- Percentage of cows to AB decreased

Historically, all artificial inseminations (AI) were recorded on the LIC Herd Improvement Database. This was the main source of insemination data for many years, however, with various changes over time it no longer holds all AI records. For the 1997/98 season and onwards, insemination data now comes from the Dairy Industry Good Animal Database (DIGAD) which has a more complete record of AB from all service providers (see <https://www.dairynz.co.nz/animal/animal-evaluation/animal-database/> for more information about this database).

Table 4.8 provides a summary of cows mated to AB for the last nine seasons. The percentage of cows to AB (81.4%) in 2021/22 was slightly down on the previous season (81.7%), with a total of 3.942 million cows mated to AB (Graph 4.4). The number of yearlings to AB decreased (by 0.2%) to 239,287 from 239,806 in the previous season (Table 4.8).

**Table 4.8: Trend in Artificial Breeding use for the last nine seasons by region: Cows and yearlings to AB**

### Cows to AB

Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Northland	209,635	210,234	201,375	199,632	196,026	195,621	189,878	186,038	175,319
Auckland	84,107	82,783	75,051	74,420	70,380	69,861	71,851	70,120	65,816
Waikato	940,988	954,283	914,421	886,130	890,176	897,212	881,050	873,837	865,724
Bay of Plenty	160,599	163,618	154,235	146,688	145,504	146,087	142,938	139,795	133,432
Central Plateau	180,388	189,688	199,126	204,888	211,443	214,979	213,610	209,742	203,063
Western Uplands	30,827	32,617	29,045	30,772	31,396	33,127	32,906	31,736	30,690
East Coast	2,905	3,278	2,431	2,290	2,603	1,607	1,799	1,942	1,730
Hawkes Bay	41,555	41,310	38,912	36,904	41,707	41,646	39,906	37,593	36,851
Taranaki	428,047	432,907	414,757	396,796	398,339	400,927	397,993	392,771	391,354
Manawatu	168,870	175,358	169,732	166,311	166,464	168,730	164,735	164,549	162,565
Wairarapa	141,390	141,090	133,622	131,522	131,403	131,603	128,261	124,941	120,680
Nelson/ Marlborough	74,769	74,523	71,060	68,652	67,212	66,560	63,194	61,325	56,842
West Coast	118,416	126,154	125,130	119,911	119,368	119,942	117,433	118,743	113,977
North Canterbury	560,977	594,762	596,988	605,246	624,347	641,371	640,339	645,071	642,531
South Canterbury	193,301	200,416	200,215	203,784	209,434	217,619	214,864	217,202	213,525
Otago	207,386	222,344	220,782	220,678	230,692	228,920	228,278	233,345	233,268
Southland	452,937	485,179	480,368	477,041	490,929	490,235	490,623	495,835	494,520
<b>New Zealand</b>	<b>3,997,097</b>	<b>4,130,544</b>	<b>4,027,250</b>	<b>3,971,665</b>	<b>4,027,423</b>	<b>4,066,047</b>	<b>4,019,658</b>	<b>4,004,585</b>	<b>3,941,887</b>

**% Cows to AB**

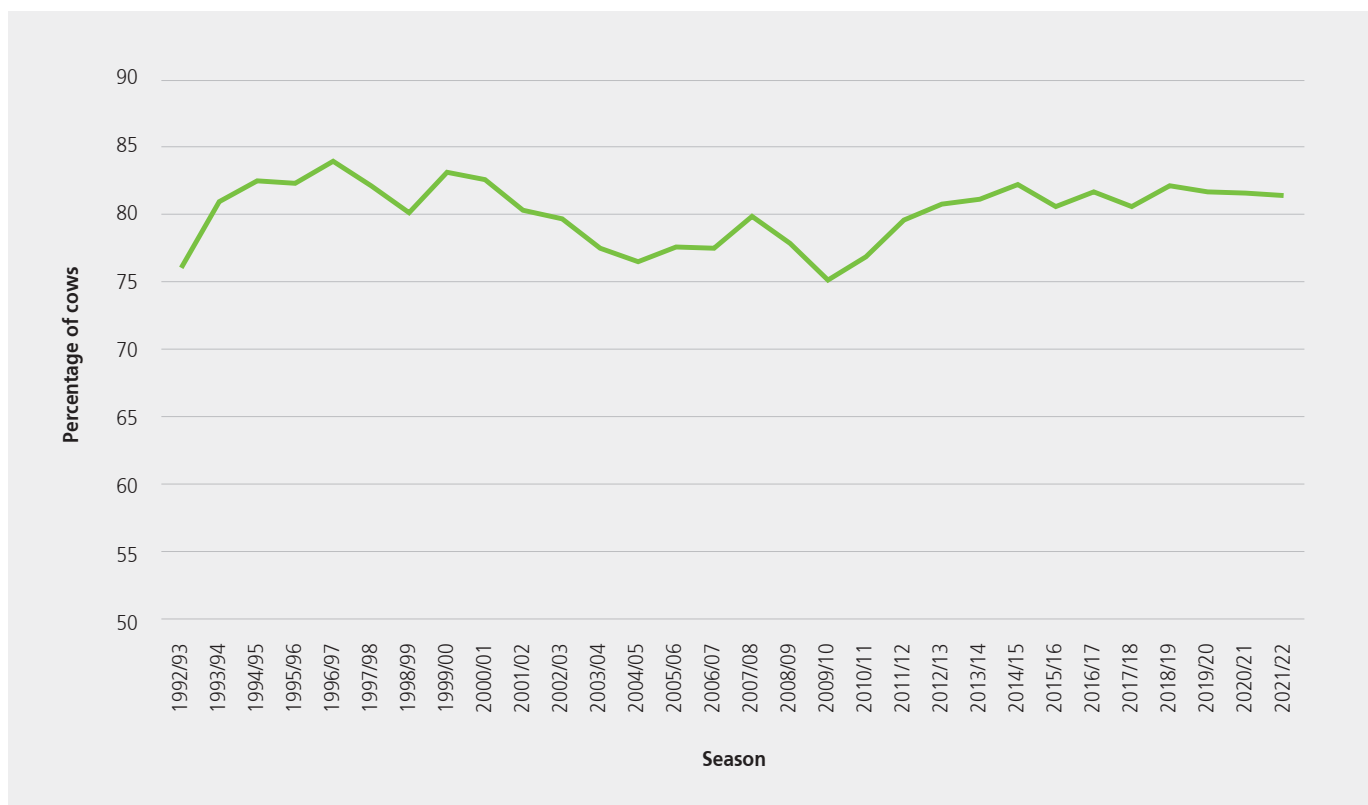
<i>Region</i>	<i>2013/14</i>	<i>2014/15</i>	<i>2015/16</i>	<i>2016/17</i>	<i>2017/18</i>	<i>2018/19</i>	<i>2019/20</i>	<i>2020/21</i>	<i>2021/22</i>
Northland	73.6	73.7	71.8	74.2	72.1	74.1	73.5	74.2	72.1
Auckland	75.9	72.6	67.5	71.3	66.7	70.3	75.0	74.0	70.3
Waikato	80.8	81.3	79.4	79.3	78.4	80.3	79.8	79.5	80.1
Bay of Plenty	81.3	81.5	77.6	76.6	74.3	76.9	77.1	76.2	74.7
Central Plateau	71.6	72.4	74.4	75.6	75.3	77.2	76.2	74.4	72.1
Western Uplands	69.0	70.5	62.2	69.7	65.2	68.8	70.1	65.3	64.6
East Coast	62.5	69.9	41.3	38.3	44.2	27.3	29.9	40.4	35.0
Hawkes Bay	85.8	84.4	79.8	80.8	86.1	87.2	87.7	85.1	83.5
Taranaki	86.8	87.2	85.2	83.9	83.5	85.9	85.1	84.3	85.0
Manawatu	76.8	79.7	76.8	78.1	75.5	78.0	76.9	76.3	77.3
Wairarapa	83.5	83.4	80.4	81.9	81.0	84.0	84.1	83.0	81.4
Nelson/ Marlborough	84.3	85.0	82.6	80.6	80.8	80.9	79.0	82.3	77.2
West Coast	78.8	81.1	79.2	77.0	77.5	78.4	78.3	78.8	77.5
North Canterbury	85.2	88.1	86.5	90.0	89.0	90.6	89.0	89.2	89.2
South Canterbury	82.8	82.8	83.4	87.6	83.5	86.7	85.2	88.0	87.1
Otago	82.5	84.2	84.2	86.0	86.1	84.9	84.1	85.4	86.2
Southland	82.3	84.7	83.5	84.7	84.2	82.8	82.9	83.2	83.6
<b>New Zealand</b>	<b>81.2</b>	<b>82.3</b>	<b>80.6</b>	<b>81.7</b>	<b>80.7</b>	<b>82.2</b>	<b>81.7</b>	<b>81.7</b>	<b>81.4</b>

**Yearlings to AB**

<i>Region</i>	<i>2013/14</i>	<i>2014/15</i>	<i>2015/16</i>	<i>2016/17</i>	<i>2017/18</i>	<i>2018/19</i>	<i>2019/20</i>	<i>2020/21</i>	<i>2021/22</i>
Northland	12,587	11,963	10,085	10,484	11,258	12,070	10,708	9,648	9,722
Auckland	3,962	4,402	3,132	3,053	3,226	3,219	2,892	3,987	4,251
Waikato	38,551	32,125	25,116	23,629	22,840	22,551	20,717	20,347	20,923
Bay of Plenty	10,520	10,339	8,779	8,845	9,178	9,104	9,562	8,952	9,330
Central Plateau	5,868	7,296	4,188	4,814	5,374	7,244	7,398	6,060	7,759
Western Uplands	2,346	2,016	2,523	2,305	2,170	2,502	2,497	2,254	2,031
East Coast	60	69	60	126	152	169	151	160	409
Hawkes Bay	3,459	2,612	4,583	1,864	3,213	3,302	2,552	2,343	2,022
Taranaki	8,507	7,159	4,726	4,539	4,625	5,666	5,542	5,156	5,754
Manawatu	8,978	9,471	5,808	6,860	6,763	7,587	6,077	6,898	6,447
Wairarapa	6,087	5,403	4,789	5,141	4,626	5,130	4,728	4,895	4,514
Nelson/ Marlborough	5,779	4,566	3,318	3,834	4,404	4,648	4,545	3,592	3,688
West Coast	5,610	4,832	3,988	4,954	5,569	6,101	6,702	8,647	8,451
North Canterbury	49,541	49,108	39,060	45,613	58,751	69,553	73,242	68,046	64,334
South Canterbury	28,855	28,639	22,969	23,820	24,033	25,647	24,764	23,969	25,921
Otago	21,293	21,654	18,680	19,747	23,992	28,119	28,332	25,911	26,052
Southland	40,947	43,060	30,904	31,994	39,970	46,107	42,047	38,941	37,679
<b>New Zealand</b>	<b>252,950</b>	<b>244,714</b>	<b>192,708</b>	<b>201,622</b>	<b>230,144</b>	<b>258,719</b>	<b>252,456</b>	<b>239,806</b>	<b>239,287</b>

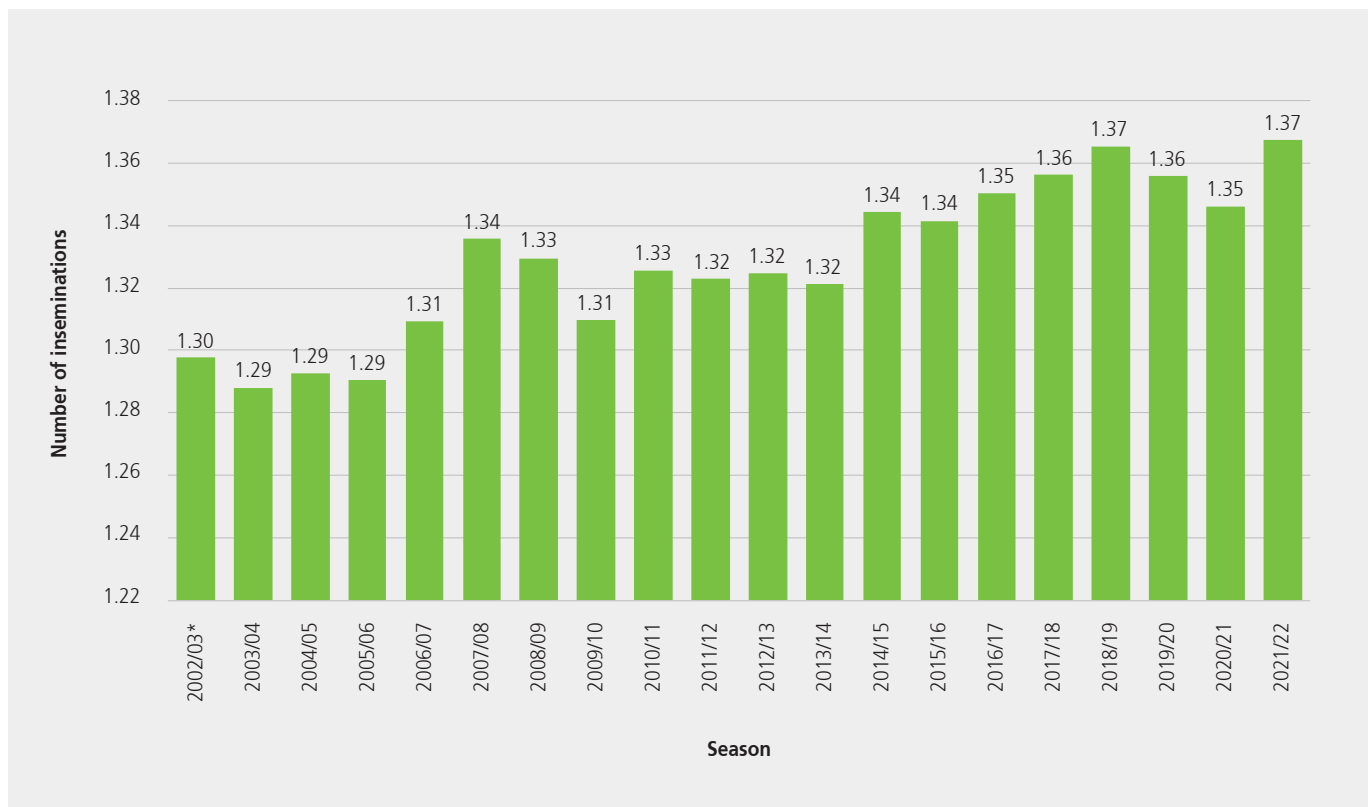


Graph 4.4: Trend in the percentage of cows to Artificial Breeding for the last 30 seasons



In 2021/22 the average number of inseminations per cow (recorded in DIGAD\*) was 1.37 (Graph 4.5).

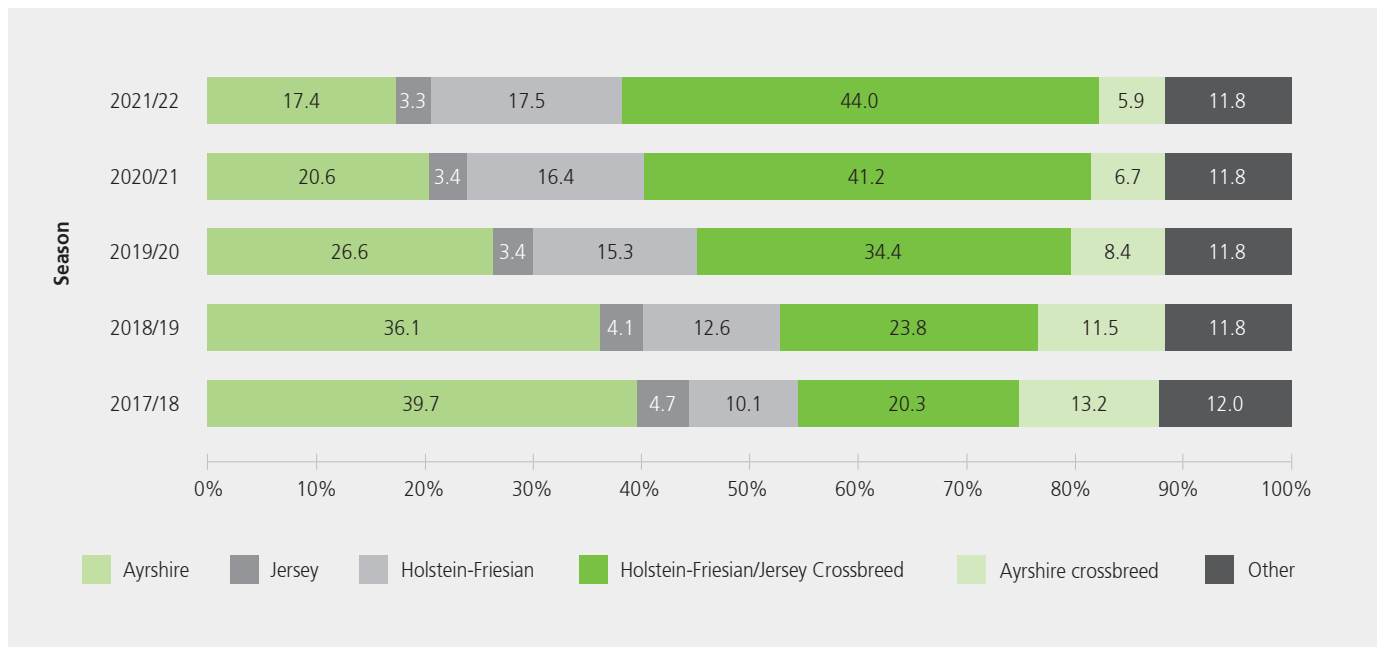
Graph 4.5: Average number of inseminations per cow for the last 20 seasons



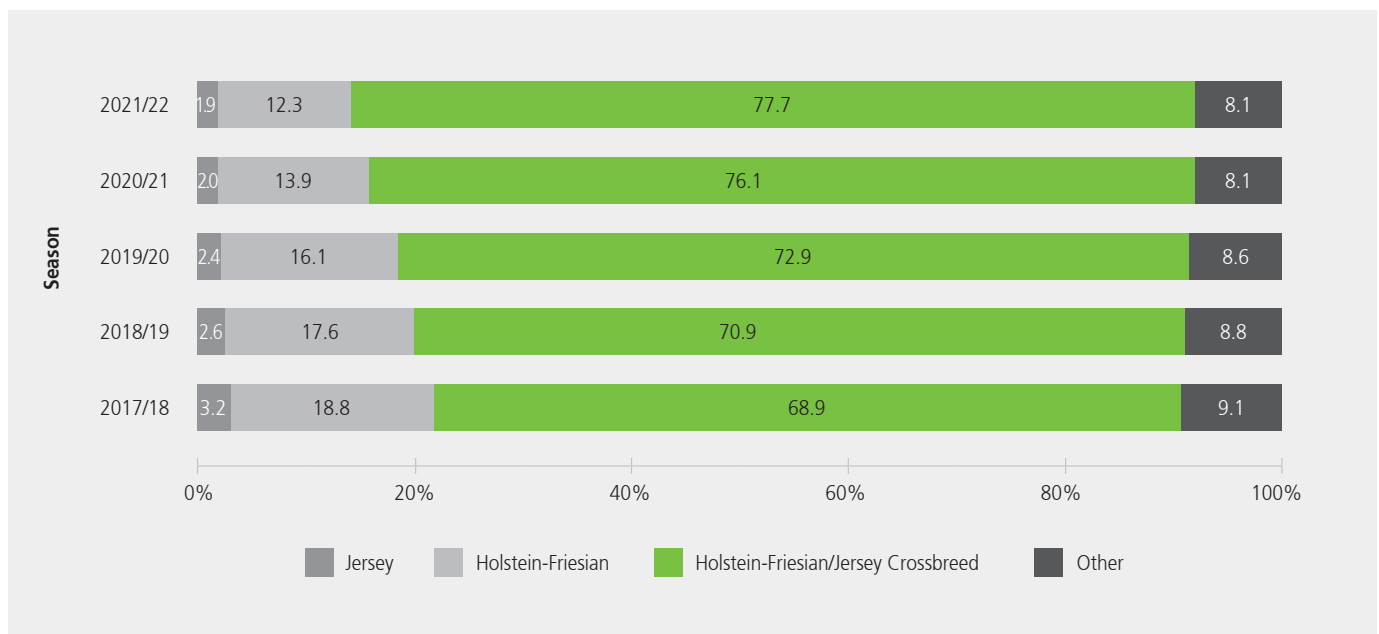
\* Previously reported data for graph 4.5 came from the LIC Herd Improvement Database

The use of Ayrshire, Holstein-Friesian and Jersey semen over different cow breeds for the past five seasons is shown in the graphs below. The use of Ayrshire semen over Ayrshire cows is no longer the dominant trend in Ayrshire semen use, with more being used over Holstein-Friesian/Jersey crosses (44%) and Holstein-Friesian (17.5%) as in Graph 4.6. Holstein-Friesian/Jersey Crossbreed semen is used predominantly over Holstein-Friesian/Jersey crosses (Graph 4.7). Similar to Ayrshire, the use of Jersey semen over Jersey cows is no longer the main trend. Jersey semen is now predominately used over Holstein-Friesian/Jersey crosses (45.2%), as illustrated in Graph 4.8. The use of Holstein-Friesian semen remains predominately over Holstein-Friesian/Jersey cross cows (53.7%), followed by Holstein-Friesian cows (38.8%) (Graph 4.9).

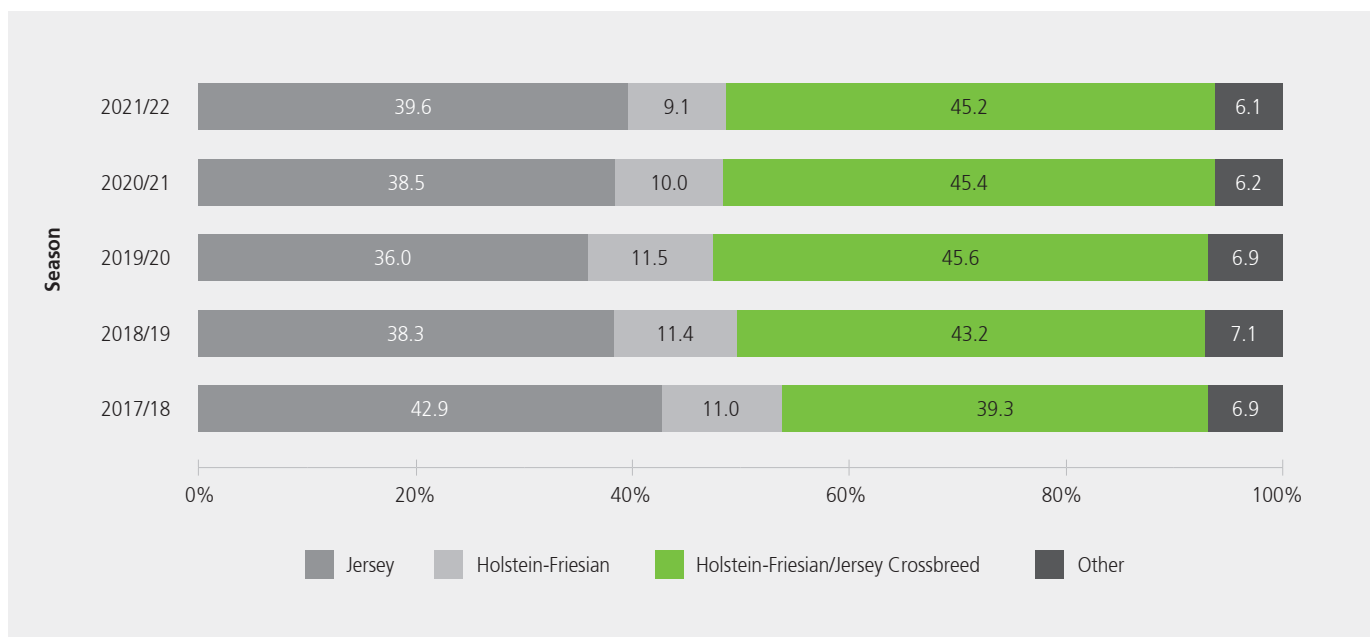
**Graph 4.6: Ayrshire semen usage (%) over breed category for the last five seasons**



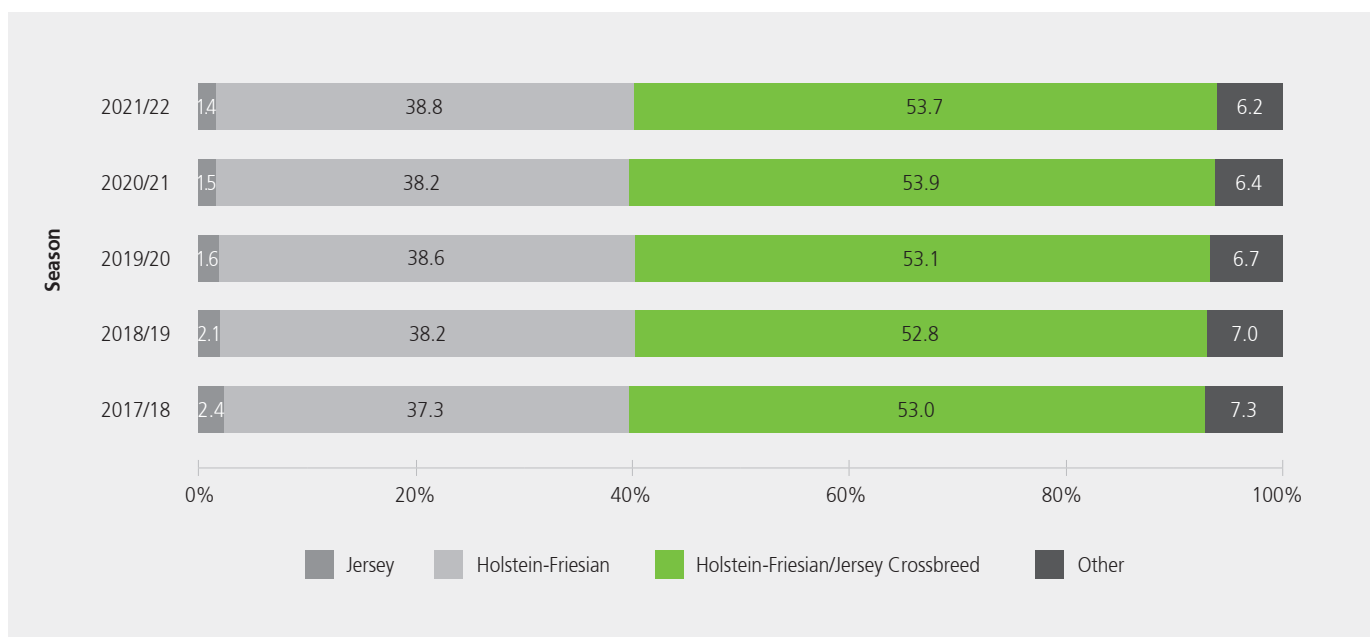
**Graph 4.7: Holstein-Friesian / Jersey Crossbreed semen usage (%) over breed category for the last five seasons**



Graph 4.8: Jersey semen usage (%) over breed category for the last five seasons

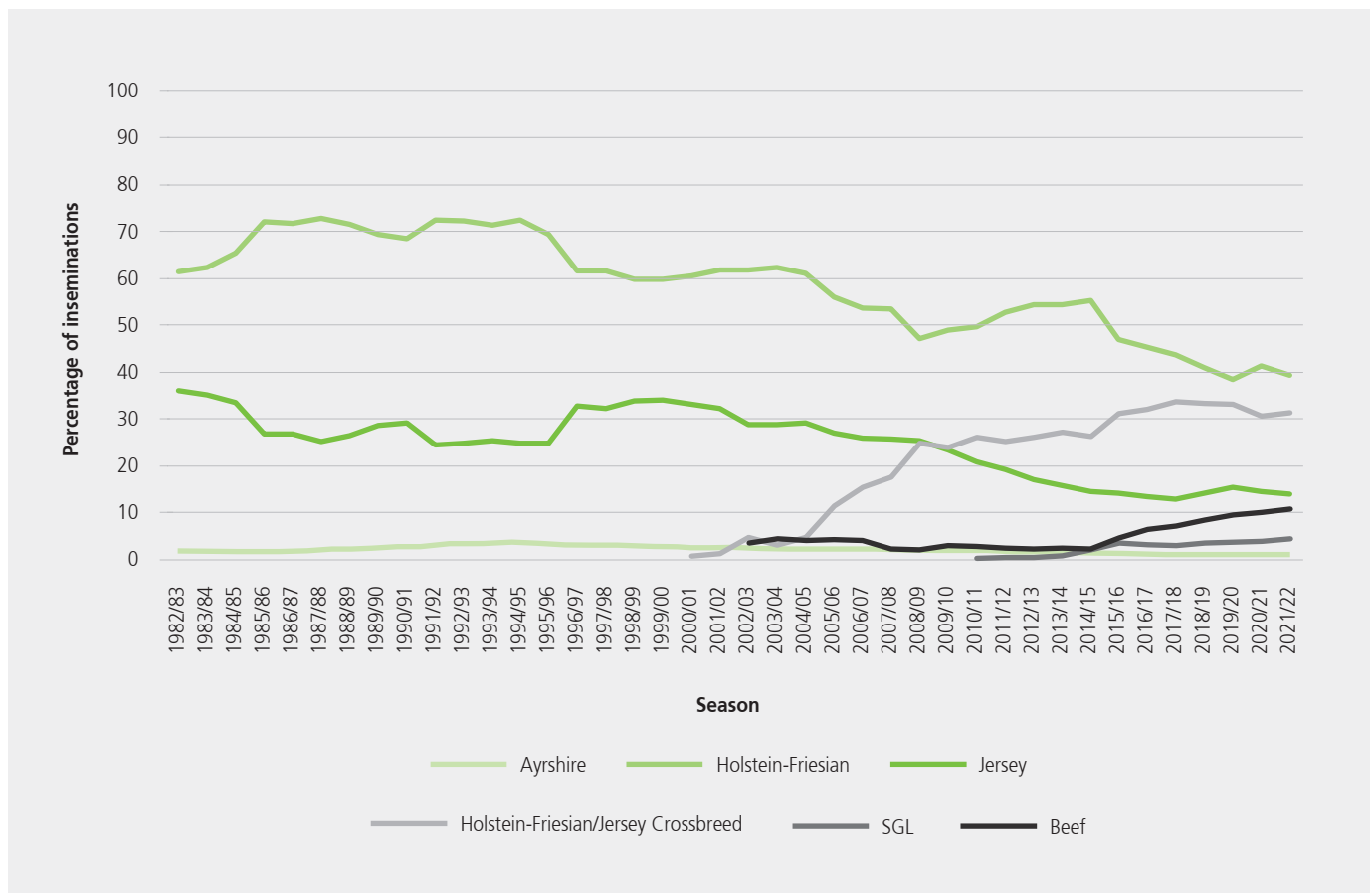


Graph 4.9: Holstein-Friesian semen usage (%) over breed category for the last five seasons



The percentage of inseminations for each of the main breed categories (Holstein-Friesian, Jersey, Holstein-Friesian/Jersey Crossbreed, Ayrshire, Short Gestation Length (SGL) and Beef), as recorded on DIGAD, is shown in Graph 4.10. The percentage of inseminations for Jersey and Holstein-Friesians decreased slightly compared with the previous season in which there were minor increases. There were marginal increases in the percentage of inseminations for Ayrshire, Holstein-Friesian-Jersey crossbreeds, SGL and beef breeds compared to the previous season.

**Graph 4.10: Trend in the percentage of inseminations of each breed category for the last 40 seasons**



## D. Herd Reproduction

Reproductive performance is a key determinant of farm productivity. The 6-week in-calf rate is the best overall measure of herd reproductive performance and is used to compare performance between herds and to monitor national performance.

The not-in-calf rate at end of mating is important at a herd level, but is not suitable for comparison between herds due to differences in length of mating period.

Actual 6-week in-calf rate (Detailed Fertility Focus Reports) is calculated for herds with sufficient early aged pregnancy test records (at least 80% of cows in the herd, and at least 80% of all pregnancy test results are less than or equal to 122 days pregnant, or non-pregnant).

The 6-week in-calf rate for herds without sufficient early aged pregnancy test records is estimated from calving and mating data (Intermediate Fertility Focus Reports).

The statistics in this section are for LIC MINDA® recording herds only.

Since the launch of the DairyNZ InCalf programme in 2008/09, there has been a trend towards more early aged pregnancy testing and thus an increase of actual results available from Detailed Fertility Focus Reports. The number of herds with detailed reports has increased from 354 in 2008/09 to 4,671 in 2021/22 (Table 4.9).

The mean actual 6-week in-calf rate of 67.4% is slightly lower than the previous three seasons. The mean estimated 6-week in-calf rates are 2-4% lower than the mean actual 6-week in-calf rate, but a similar trend is evident.

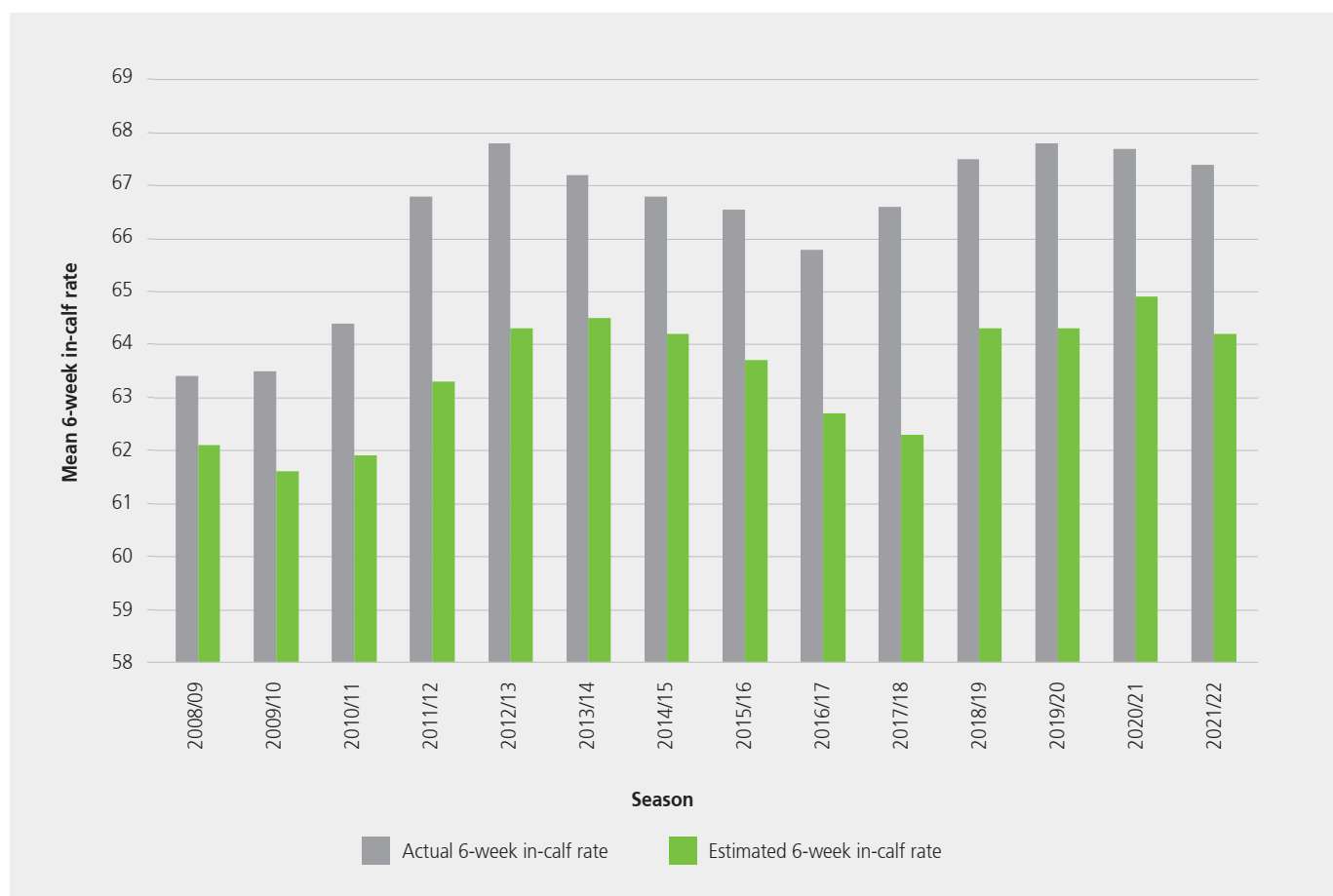
The mean 3-week submission rate is lower in 2021/22 compared with the previous season, while the mean conception rate dropped (by 0.9%) compared with the previous season. Conception rates are not available for Intermediate Fertility Focus Reports.

**Table 4.9: Mean herd reproductive performance since 2008/09**

Mating season	Actual				Estimated		
	Number of herds	Mean 6-week in-calf rate (%)	Mean 3-week submission rate (%)	Mean conception rate (%)	Number of herds	Mean 6-week in-calf rate (%)	Mean 3-week submission rate (%)
2008/09	354	63.4	78.5	50.1	4,872	62.1	72.7
2009/10	712	63.5	77.5	51.0	4,749	61.6	72.2
2010/11	982	64.4	78.7	50.7	4,090	61.9	72.6
2011/12	1,341	66.8	80.7	52.2	4,051	63.3	76.0
2012/13	1,862	67.8	81.6	52.9	4,034	64.3	76.6
2013/14	2,363	67.2	80.8	52.5	3,874	64.5	76.5
2014/15	2,895	66.8	81.1	52.6	3,918	64.2	76.2
2015/16	3,646	66.5	80.0	52.4	4,778	63.7	75.0
2016/17	3,952	65.8	78.1	53.4	4,566	62.7	72.0
2017/18	3,963	66.6	79.1	54.0	4,035	62.3	73.2
2018/19	4,207	67.5	80.7	54.1	3,883	64.3	76.0
2019/20	4,430	67.8	80.2	54.2	3,624	64.3	75.7
2020/21	4,492	67.7	81.3	52.7	3,527	64.9	76.4
2021/22	4,671	67.4	80.4	51.8	3,208	64.2	75.9

**Note:** Results for 2008/09 and 2009/10 are based on version 1.0 of the Fertility Focus Report software. Results for 2010/11 until 2015/16 are from version 2.15 and results for 2016/17 onwards are from version 3.01. These updated versions had improvements made to calculations and reflect more correctly what the national performance is.

Graph 4.11: Mean actual and estimated 6-week in-calf rate since 2008/09



**Note:** Results for 2008/09 and 2009/10 are based on version 1.0 of the Fertility Focus Report software. Results for 2010/11 until 2015/16 are from version 2.15 and results for 2016/17 onwards are from version 3.01. These updated versions had improvements made to calculations and reflect more correctly what the national performance is.

Mean actual 6-week in-calf rate by region ranged between 64.5% (Hawke's Bay/Manawatu/ Wairarapa) and 68.7% (Taranaki) in 2021/22 (Table 4.10). Canterbury and Otago/Southland were the only regions which recorded a slight increase over the previous season.

Table 4.10: Mean 6-week in-calf rate by farming region for the last three seasons.

Farming region	Actual						Estimated					
	2019/20		2020/21		2021/22		2019/20		2020/21		2021/22	
	Number of herds	Mean 6-week in-calf rate (%)	Number of herds	Mean 6-week in-calf rate (%)	Number of herds	Mean 6-week in-calf rate (%)	Number of herds	Mean 6-week in-calf rate (%)	Number of herds	Mean 6-week in-calf rate (%)	Number of herds	Mean 6-week in-calf rate (%)
Northland / Auckland	237	68.5	228	68.7	239	66.7	369	62.7	364	63.3	329	62.0
Waikato / Western Uplands	1,188	69.2	1,171	68.4	1,233	68.1	1,127	65.0	1,102	65.4	1,006	64.6
BoP / Central Plateau / East Coast	400	67.4	402	66.9	400	66.1	331	63.8	322	64.4	300	64.4
Hawkes Bay / Manawatu / Wairarapa	361	66.0	338	65.7	352	64.5	284	62.5	297	64.4	252	62.4
Taranaki	396	69.1	414	68.8	412	68.7	824	65.8	808	66.1	780	65.7
West Coast / Nelson / Marlborough	157	66.7	170	68.6	182	66.8	266	63.7	259	64.2	232	63.4
North & South Canterbury	825	66.8	849	67.4	878	67.8	166	62.9	151	64.1	129	63.8
Otago / Southland	866	67.5	920	67.1	975	67.7	257	62.4	224	63.9	180	63.5

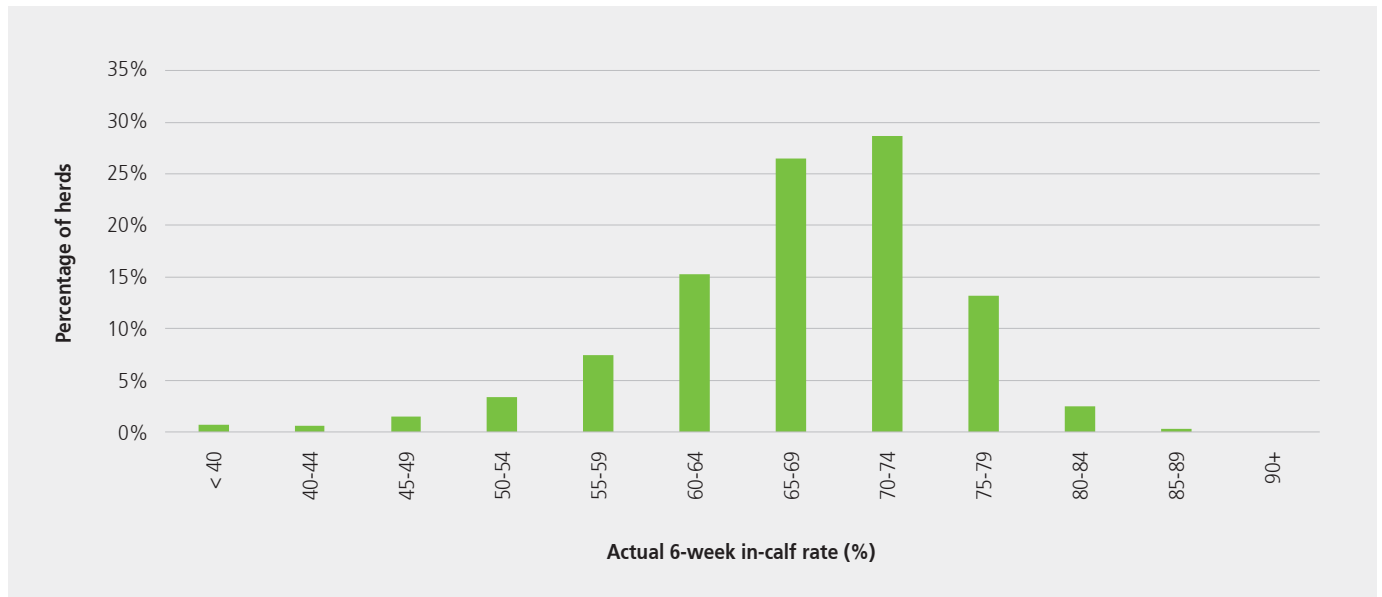
**Note:** Results reported in this table are from an improved version of the Fertility Focus Report software and will differ from earlier publications.

In 2021/22, 50% of herds had an actual 6-week in-calf rate of 69% or higher and 10% had an in-calf rate of 76% or higher (Table 4.11). Ten percent of herds had 6-week-in-calf rate of 57% or lower.

**Table 4.11: Actual 6-week in-calf rate in 2021/22**

	<b>Number of herds</b>	<b>Median</b>	<b>Top 10%</b>	<b>Top 25%</b>	<b>Bottom 25%</b>	<b>Bottom 10%</b>
6-week in-calf rate	4,671	69	> 76	> 73	< 63	< 57

**Graph 4.12: Distribution of actual 6-week in-calf rate in 2021/22**

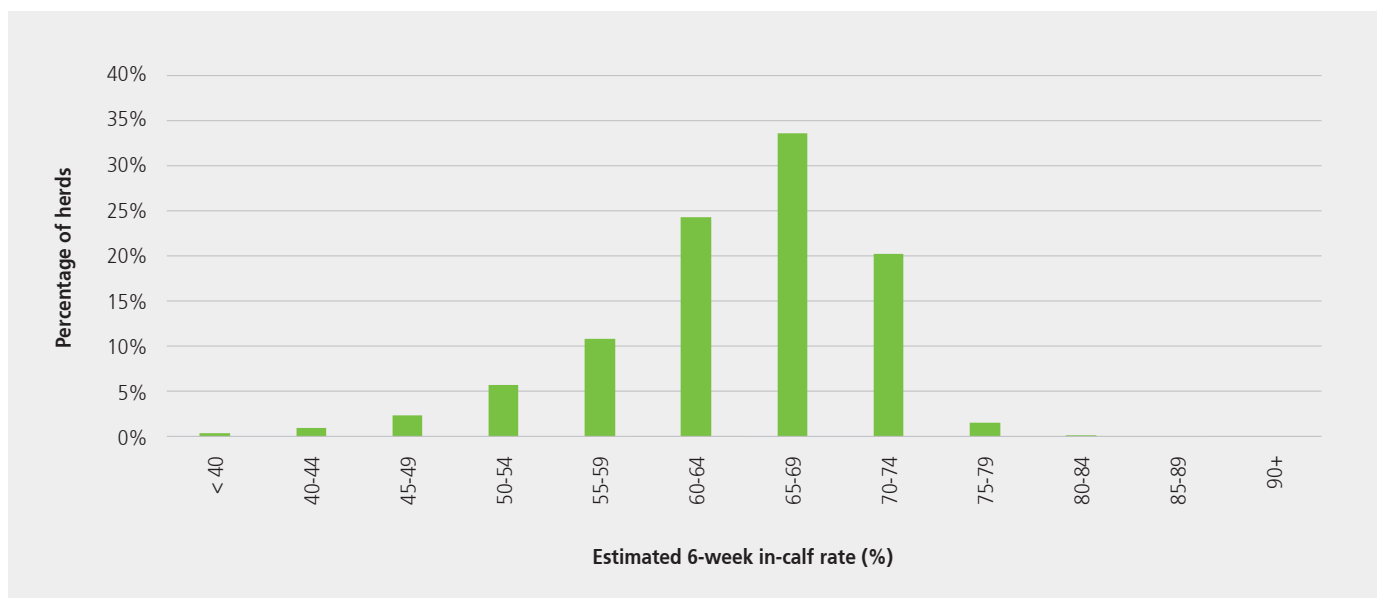


The distribution of estimated 6-week in-calf rates is tighter than the actual results, reflecting that estimates tend towards the mean. This is because estimates for low performing herds tend to be overestimated, while estimates for high performing herds tend to be underestimated. In 2021/22, 50% of herds had an estimated 6-week in-calf rate of 65% or higher and 10% of herds had an estimated 6-week in-calf rate of 71% or higher (Table 4.12). Ten percent of herds had an in-calf rate of 55% or lower.

**Table 4.12: Estimated 6-week in-calf rate in 2021/22**

	<b>Number of herds</b>	<b>Median</b>	<b>Top 10%</b>	<b>Top 25%</b>	<b>Bottom 25%</b>	<b>Bottom 10%</b>
6-week in-calf rate	3,208	65	> 71	> 69	< 61	< 55

**Graph 4.13: Distribution of estimated 6-week in-calf rate in 2021/22**



## E. Calving

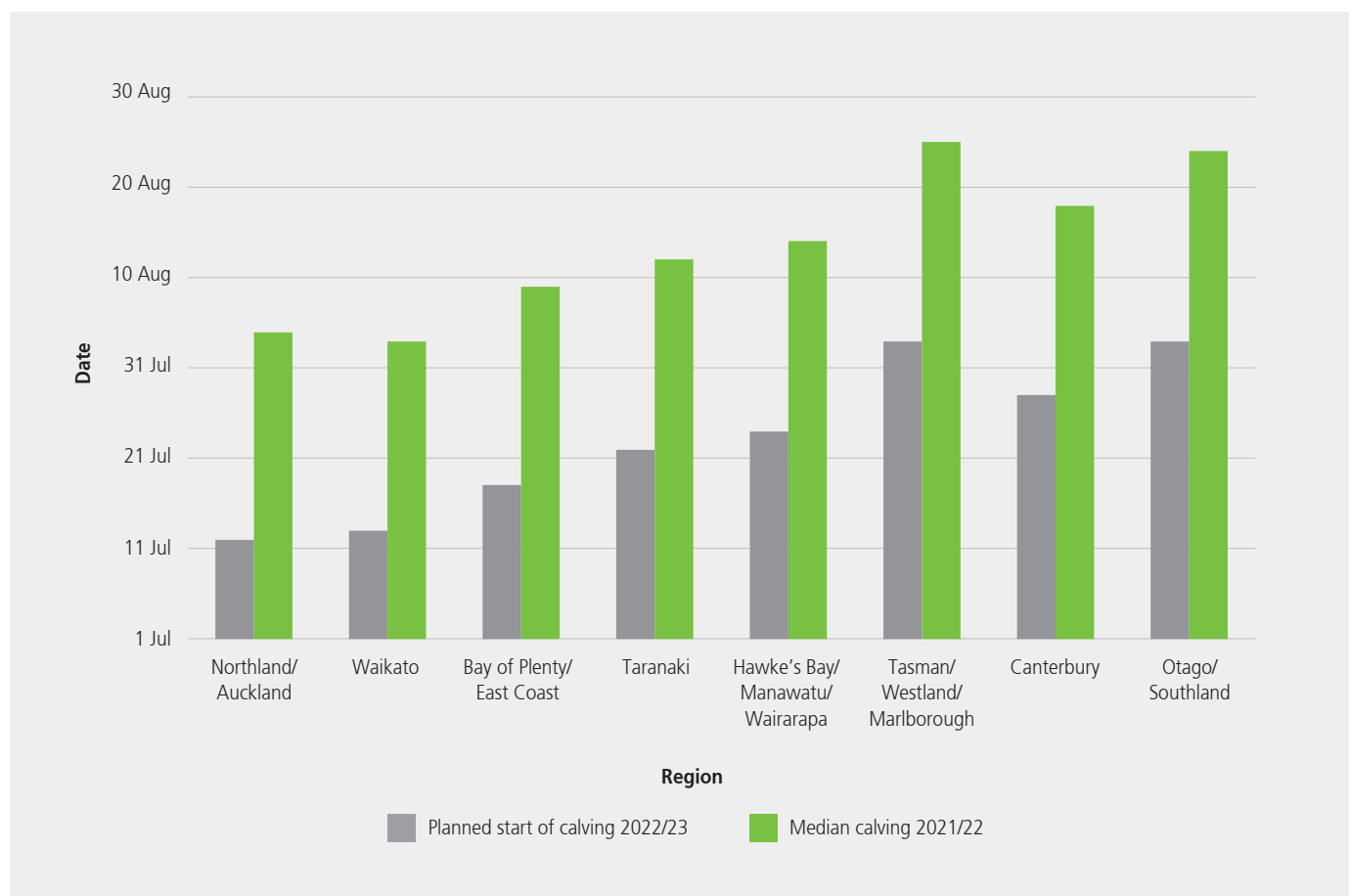
### i) Planned start of calving and median calving dates

The trend in calving dates within and between regions is best shown by the "planned start of calving" date. The planned start of calving date is 279 days from the date that mating is started in the herd. The farmer has control over, and the ability to change, the start of mating.

Mating and calving information is recorded on the LIC Herd Improvement Database for approximately 80-85% of all herds. Historically this has been the source used for graphs 4.14-4.15. However, for this season, and going forward, the data for these graphs is now sourced from the Dairy Industry Good Animal Database (DIGAD).

The median calving date (the date that occupies the middle position after the dates are arranged in ascending order) is used as an indicator of actual calving spread. The forecasted planned start of calving and actual median calving dates for cows (excluding first calvers) for the 2021/22 season are shown in Graph 4.14.

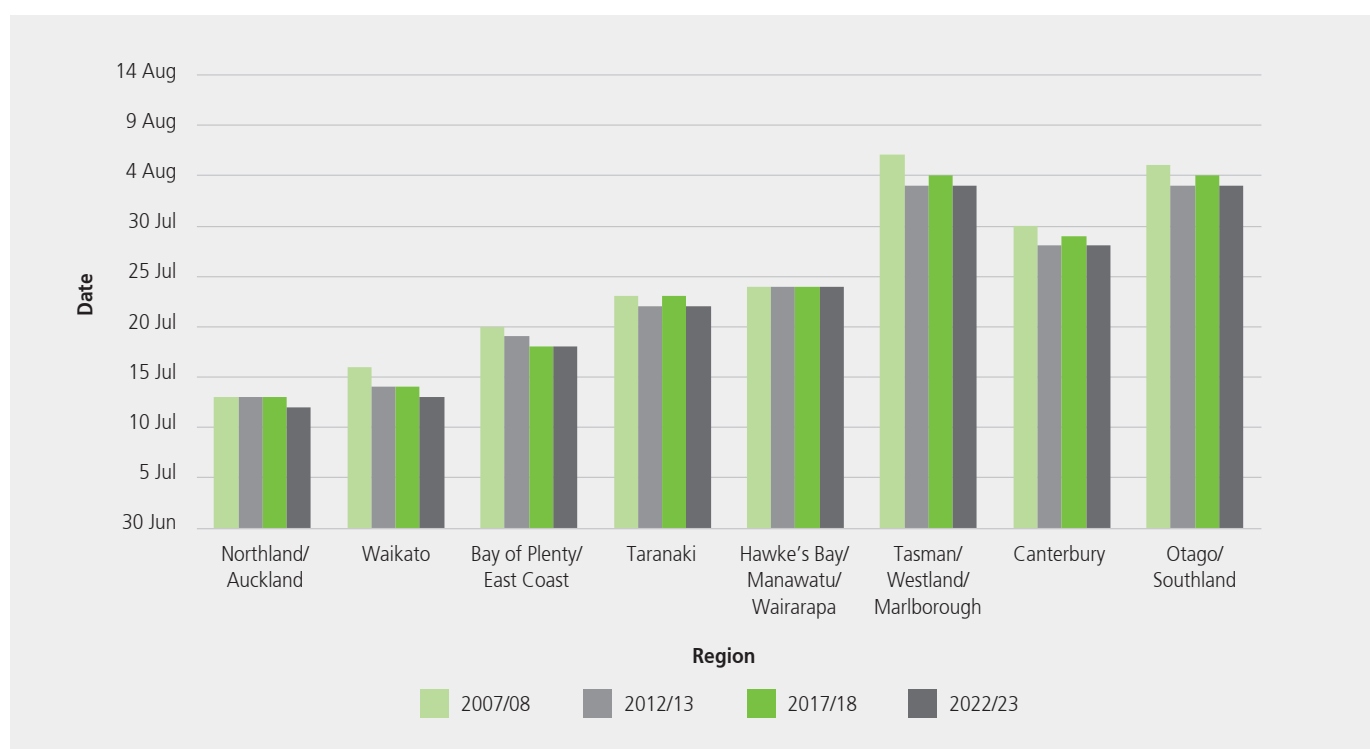
**Graph 4.14: Planned start of calving and median calving dates for cows (excluding first calvers) by region**



The planned start of calving for five-yearly intervals since 2007/08 is shown in Graph 4.15. The trend has generally been for an earlier planned start of calving, particularly compared with five and fifteen years ago. For the 2022/23 season this pattern continues, albeit with the lower North Island and the South Island regions either maintaining or returning to a similar planned start of calving date compared with ten years ago. Northland/Auckland and Hawkes Bay/Manawatu/Wairarapa have seen less of the move to an earlier planned start of calving, having maintained the same planned start of calving date across all four seasons with the exception of the 2022/23 season for Northland/Auckland.



Graph 4.15: Trend in planned start of calving dates for cows (excluding first calvers) by region



## ii) Calving interval

The calving interval for a cow is the number of days between her calving date in the current season and her calving date in the preceding season. No interval is calculated for first-calving heifers. The average calving interval is based on all recorded calving dates for cows calving during the period from 1 June to 30 November. All records where pregnancy was terminated were excluded.

Table 4.13: Mean calving interval by breed for the past 20 seasons

Season	All breeds		Holstein-Friesian		Jersey		Friesian/Jersey Cross		Ayrshire	
	Average number of days	Number of records	Average number of days	Number of records	Average number of days	Number of records	Average number of days	Number of records	Average number of days	Number of records
2001/02	368.3	2,097,450	368.7	1,006,364	367.7	345,319	367.9	623,724	369.7	24,629
2002/03	368.4	2,132,518	368.6	985,444	368.3	346,807	368.0	675,826	369.4	23,356
2003/04	368.9	2,196,035	369.4	973,475	368.1	350,791	368.7	741,287	368.9	22,578
2004/05	369.5	2,224,310	370.1	938,917	368.7	354,489	369.1	796,123	370.6	22,041
2005/06	367.8	2,259,307	368.1	912,159	367.7	357,876	367.4	848,511	368.1	22,028
2006/07	368.8	2,284,904	369.2	894,409	369.0	352,605	368.4	894,423	370.4	21,693
2007/08	369.9	2,366,496	370.4	892,137	369.7	359,060	369.5	962,110	371.1	20,817
2008/09	370.1	2,371,481	370.9	854,145	368.8	349,362	369.6	993,439	371.9	19,570
2009/10	368.7	2,491,106	369.1	862,333	368.2	350,729	368.4	1,078,514	369.3	19,233
2010/11	368.6	2,635,811	369.2	874,286	368.1	350,657	368.2	1,186,252	370.4	19,083
2011/12	368.3	2,822,535	368.5	892,597	368.0	354,579	368.2	1,326,898	369.2	19,585
2012/13	368.8	2,944,199	369.2	892,935	368.4	351,474	368.8	1,439,191	369.5	19,971
2013/14	368.4	3,061,203	368.8	891,391	368.1	343,516	368.3	1,561,489	369.9	19,731
2014/15	368.4	3,094,305	368.9	864,802	367.8	326,630	368.3	1,636,293	369.0	18,606
2015/16	369.5	3,057,382	369.9	817,447	368.5	301,341	369.5	1,685,666	370.0	16,733
2016/17	371.0	3,095,188	371.6	805,668	370.3	283,151	370.8	1,748,619	370.7	15,489
2017/18	368.6	3,079,065	369.2	784,929	367.8	266,012	368.5	1,773,959	369.8	14,358
2018/19	369.0	3,078,308	369.3	765,489	368.5	254,974	368.9	1,812,504	369.5	13,686
2019/20	369.0	3,073,988	369.3	744,440	368.3	246,057	369.0	1,841,992	369.1	12,846
2020/21	369.4	3,038,733	369.8	716,265	368.9	235,352	369.3	1,853,430	369.3	11,988

## F. Animal Evaluation

The genetic merit of New Zealand dairy cows and sires is estimated using statistical methods which allow simultaneous evaluation of cows and sires of all breeds, using all recorded relationships. Examination of the structure of the national herd reveals large numbers of crossbred cows, and large numbers of herds with mixed breeds. For this reason, the national evaluation system is designed to compare animals irrespective of breed, both nationally and within herd, to assist farmers to select the most profitable animals for the future.

There are two types of evaluations calculated for New Zealand dairy animals:

- 1. Trait evaluations** are estimates of an animal's genetic merit (Breeding Values) for individual traits including milkfat, protein, volume, liveweight, somatic cell, fertility, body condition score, functional survival and udder overall. There are also estimates of an animal's lifetime productive ability (Production Values) for milkfat, protein, volume, somatic cell and liveweight.
- 2. Economic evaluations** combine an animal's individual trait evaluations to estimate its comparative ability to convert feed into profit, through breeding replacements (Breeding Worth) and lifetime production (Production Worth).

For each economic index, Economic Values are calculated for the relevant traits. For Breeding Worth, the Economic Values represent the net income per unit of feed from breeding replacements with a one-unit genetic improvement in the trait. For Production Worth, the Economic Values represent the net income per unit of feed from milking cows with a one unit improved productive ability in the trait. In each case the base unit of feed is 5 tonnes of dry matter in average quality pasture.

The profit-related traits are combined into a single economic index. For example,

<b>Breeding Worth =</b>	<b>Milkfat BV</b>	<b>x</b>	<b>\$EV (Milkfat)</b>	<b>+</b>
	<b>Protein BV</b>	<b>x</b>	<b>\$EV (Protein)</b>	<b>+</b>
	<b>Milk BV</b>	<b>x</b>	<b>\$EV (Milk)</b>	<b>+</b>
	<b>Liveweight BV</b>	<b>x</b>	<b>\$EV (Liveweight)</b>	<b>+</b>
	<b>Somatic Cell BV</b>	<b>x</b>	<b>\$EV (Somatic cell)</b>	<b>+</b>
	<b>Fertility BV</b>	<b>x</b>	<b>\$EV (Fertility)</b>	<b>+</b>
	<b>Body Cond. Score BV</b>	<b>x</b>	<b>\$EV (Body Cond. Score)</b>	<b>+</b>
	<b>Functional Survival BV</b>	<b>x</b>	<b>\$EV (Functional Survival)</b>	<b>+</b>
	<b>Udder Overall BV</b>	<b>x</b>	<b>\$EV (Udder Overall)</b>	

where: BV = Breeding Value for each trait

\$EV = economic value for each trait for breeding replacements

Production Worth is calculated using Production Values for the 3 production traits, somatic cell and liveweight, multiplied by the respective economic values.

Animal Evaluation provides a tool for ranking animals in terms of their expected profit per unit of feed consumed. The economic values for 2022 are presented below (Table 4.14). The economic values are reviewed annually and therefore may change from year to year. The timing of this update has historically occurred in February, but last season New Zealand Animal Evaluation Limited (NZAEL) made the decision to align any major Animal Evaluation updates with the Interbull (international) evaluation schedule. By default, this included updates to economic values. For this reason, the economic values were updated in December last season, and will continue to be updated annually in December going forward.

**Table 4.14: Economic values used from 10 December 2021**

	<b>Milkfat (\$/kg)</b>	<b>Protein (\$/kg)</b>	<b>Milk (\$/kg)</b>	<b>Liveweight (\$/kg)</b>	<b>Somatic Cell (\$/score)</b>	<b>Fertility (\$/%)</b>	<b>Body Cond. Score (\$/score)</b>	<b>Udder Overall (\$/unit)</b>	<b>Functional Survival** (\$/%)</b>
Breeding Worth	5.18	5.21	-0.095	-1.38	-42.89	6.33	116.93	17.31*	2.65
Production Worth	4.72	6.29	-0.097	-1.42	-42.69	-	-	-	-

\* Udder overall was added to BW in April 2022 with a non-linear economic value of  $54.692 \times BV + -22.912 \times BV^2$  (\$17.31 represents an udder overall BV of  $\sim 0.376$ ).

\*\* Functional Survival was added to BW in December 2021 in replacement of residual survival.

The information for all Animal Evaluation statistics was sourced from cows and sires recorded on the Livestock Improvement Database as of 28th May 2022. The evaluations were conducted with reference to a genetic base of cows born in 2005. For more information on economic values, follow these links - [www.dairynz.co.nz/animal/animal-evaluation/interpreting-the-info/economic-values](http://www.dairynz.co.nz/animal/animal-evaluation/interpreting-the-info/economic-values) and [www.lic.co.nz/about/animal-evaluation](http://www.lic.co.nz/about/animal-evaluation).

## i) Sire Evaluations

Table 4.15 shows the Breeding Values (BV) and Breeding Worth (BW) by breed, of all bulls born in 2017, first proven in the 2021/22 season with a BW Reliability of 70% or greater. Reliability of BW is reported on a scale from 0% to 99%. 0% is the case where there are no performance records for any related animal used in the bull's evaluation. 99% is the case where the bull has a very large number of performance-recorded daughters.

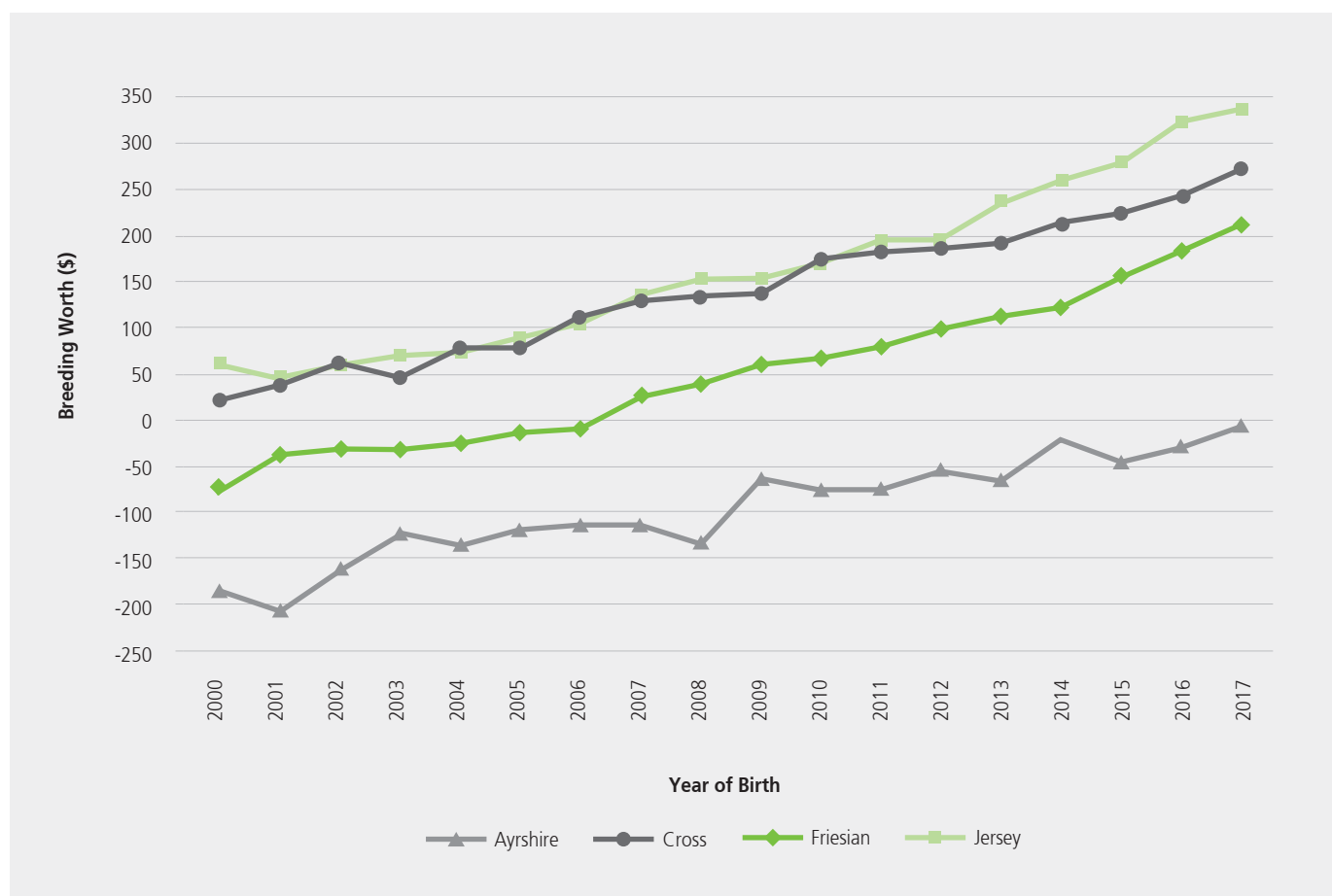
**Table 4.15: Average Breeding Values and Breeding Worth of 2017 born bulls (BW reliability of 70% or greater)**

Breed category	Milk Fat BV	Protein BV	Milk Volume BV	Liveweight BV	Somatic Cell BV	Fertility BV	Body Condition Score BV	Functional Survival BV	Udder Overall BV	Breeding Worth	Number of Bulls
Ayrshire	10.8	6.7	212.2	32.3	-0.37	-6.5	-0.06	1.01	-0.048	-6.5	3
Friesian	26.7	37.6	845.9	44.4	0.14	-0.2	0.05	1.92	0.403	211.6	130
Jersey	26.8	12.6	-214.9	-49.4	-0.22	2.7	0.00	1.97	0.376	338.4	69
Cross	28.9	27.8	332.4	8.2	0.10	0.5	0.03	1.72	0.387	273.4	94

(Evaluation date: 28 May 2022)

The genetic trend of all proven dairy bulls is shown in Graph 4.16. Note, there are only three 2017-born Ayrshire bulls that have reached a BW reliability of 70% or greater.

**Graph 4.16: Genetic trend of proven dairy bulls by year of birth (BW reliability of 70% or greater)**



(Evaluation date: 28 May 2022)

Young bulls are initially selected for use in Artificial Breeding based on the genetic merit of their sire and dam and/or genomic indices. These young sires are then progeny tested to estimate their Breeding Worth more accurately via the performance of their daughters. Each year some progeny tested bulls are returned to service for use as proven sires.

Table 4.16 shows the number of sires, by birth year and breed category, for which the Reliability of the BW was at least 70%. The information in this table is updated every year for all age groups to include older bulls that have now been proven in New Zealand.

**Table 4.16: Number of sires by birth year and breed category (reliability of BW 70% or greater, includes overseas bulls)**

Birth Year	Number of Sires	Friesian	Jersey	Ayrshire	Cross	Other
2000	543	287	138	39	68	11
2001	545	260	164	34	69	18
2002	545	274	165	28	70	8
2003	536	262	154	43	68	9
2004	555	273	158	30	76	18
2005	527	242	163	21	72	29
2006	534	258	161	29	59	27
2007	346	165	103	26	40	12
2008	371	157	108	20	68	18
2009	372	164	121	21	63	3
2010	352	176	85	18	67	6
2011	417	200	117	23	69	8
2012	433	186	109	22	107	9
2013	446	200	104	23	108	11
2014	445	205	91	20	118	11
2015	395	180	92	13	106	4
2016	335	142	82	6	100	5
2017	296	130	69	3	94	
<b>Grand Total</b>	<b>7993</b>	<b>3761</b>	<b>2184</b>	<b>419</b>	<b>1422</b>	<b>207</b>

(Evaluation date: 28 May 2022)

## ii) Cow Evaluations

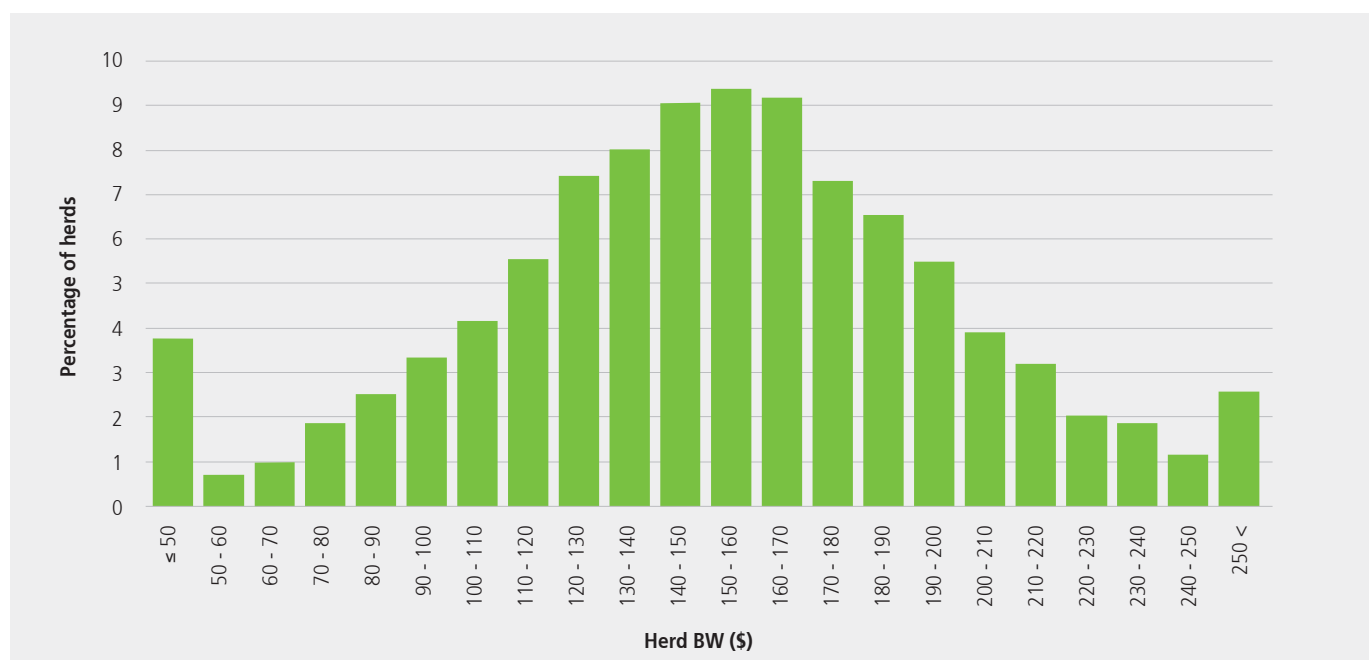
The Breeding Worth for herds presented below (Table 4.17 and Graph 4.17) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2021/22 season. Table 4.17 shows that 50% of these herds had a BW of 152.7 or above and 25% of these herds had a BW of 182.3 or above.

**Table 4.17: Herd Breeding Worth in 2021/22**

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Herd BW	152.7	>232.9	>211.8	>182.3	<122.9	<90.4	<65.9

(Evaluation date: 28 May 2022)

**Graph 4.17: Distribution of Herd Breeding Worth in 2021/22**



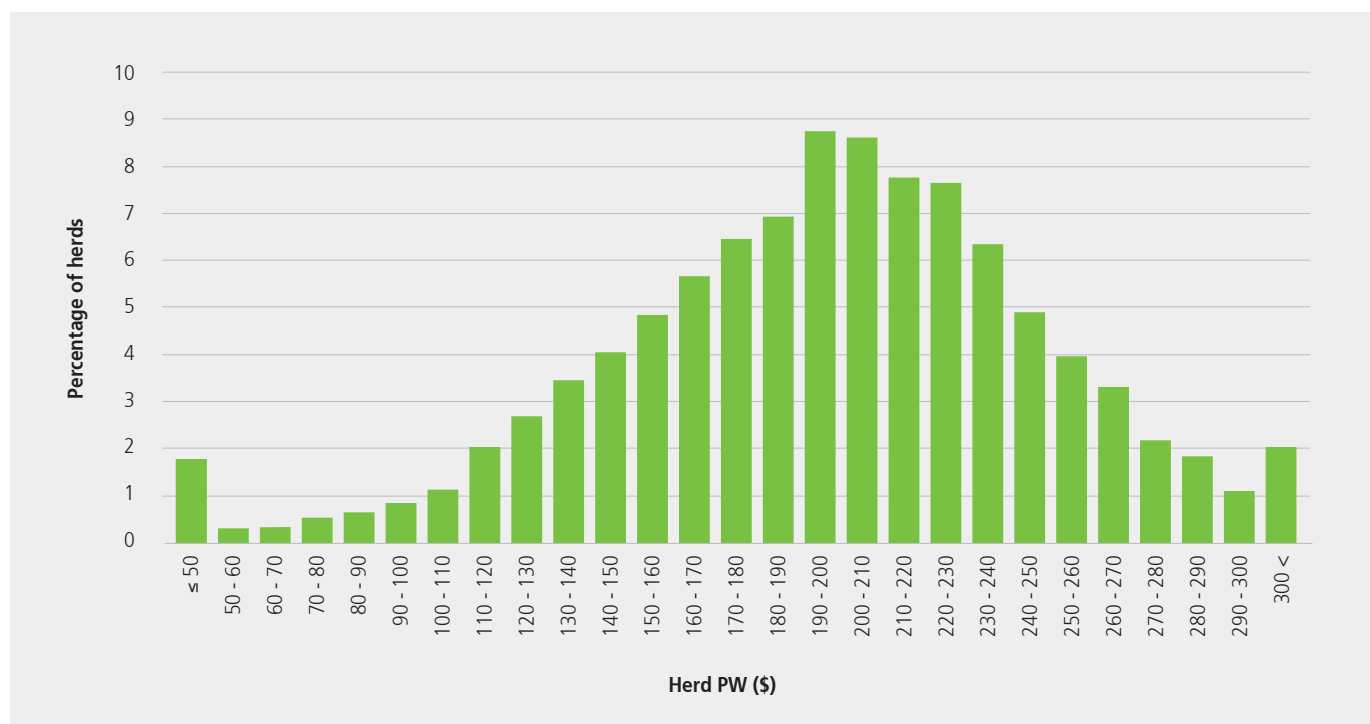
The Production Worth (PW) for herds presented below (Table 4.18 and Graph 4.18) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2021/22 season. Table 4.18 shows that 50% of these herds had a PW of 199.6 or above and 25% of these herds had a PW of 230.9 or above.

**Table 4.18: Herd Production Worth in 2021/22**

	<b>Median</b>	<b>Top 5%</b>	<b>Top 10%</b>	<b>Top 25%</b>	<b>Bottom 25%</b>	<b>Bottom 10%</b>	<b>Bottom 5%</b>
Herd PW	199.6	>279.6	>261.0	>230.9	<164.2	<129.0	<105.7

(Evaluation date: 28 May 2022)

**Graph 4.18: Distribution of Herd Production Worth in 2021/22**



(Evaluation date: 28 May 2022)

The distribution of herd Production Worth is closely aligned with the breed makeup of the herd, with the balance of milkfat to protein favouring Jersey and crossbred animals. The average breed mix of the herds within the PW range \$190-\$210 equates to approximate F10J6.

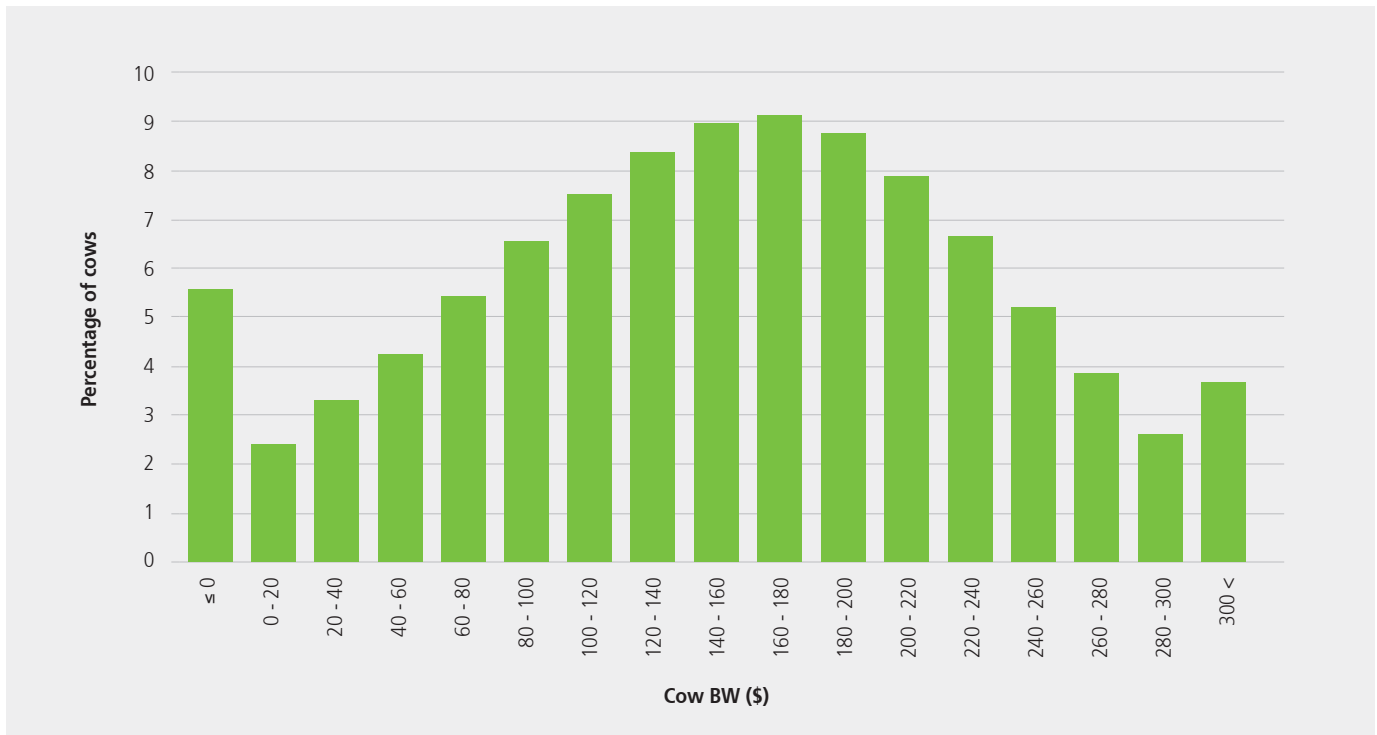
The Breeding Worth (BW) for cows presented below (Table 4.19 and Graph 4.19) is based on all cows of the users of herd testing services, in herds with at least 80 cows, and signed up for herd testing in the 2021/22 season. Table 4.19 shows that 50% of these cows had a BW of 155.1 or above and that 25% of these cows had a BW of 212.1 or above.

**Table 4.19: Cow Breeding Worth in 2021/22**

	<b>Median</b>	<b>Top 5%</b>	<b>Top 10%</b>	<b>Top 25%</b>	<b>Bottom 25%</b>	<b>Bottom 10%</b>	<b>Bottom 5%</b>
Cow BW	155.1	>288.8	>260.6	>212.1	<93.0	<33.0	<-6.0

(Evaluation date: 28 May 2022)

Graph 4.19: Distribution of Cow Breeding Worth in 2021/22



(Evaluation date: 28 May 2022)

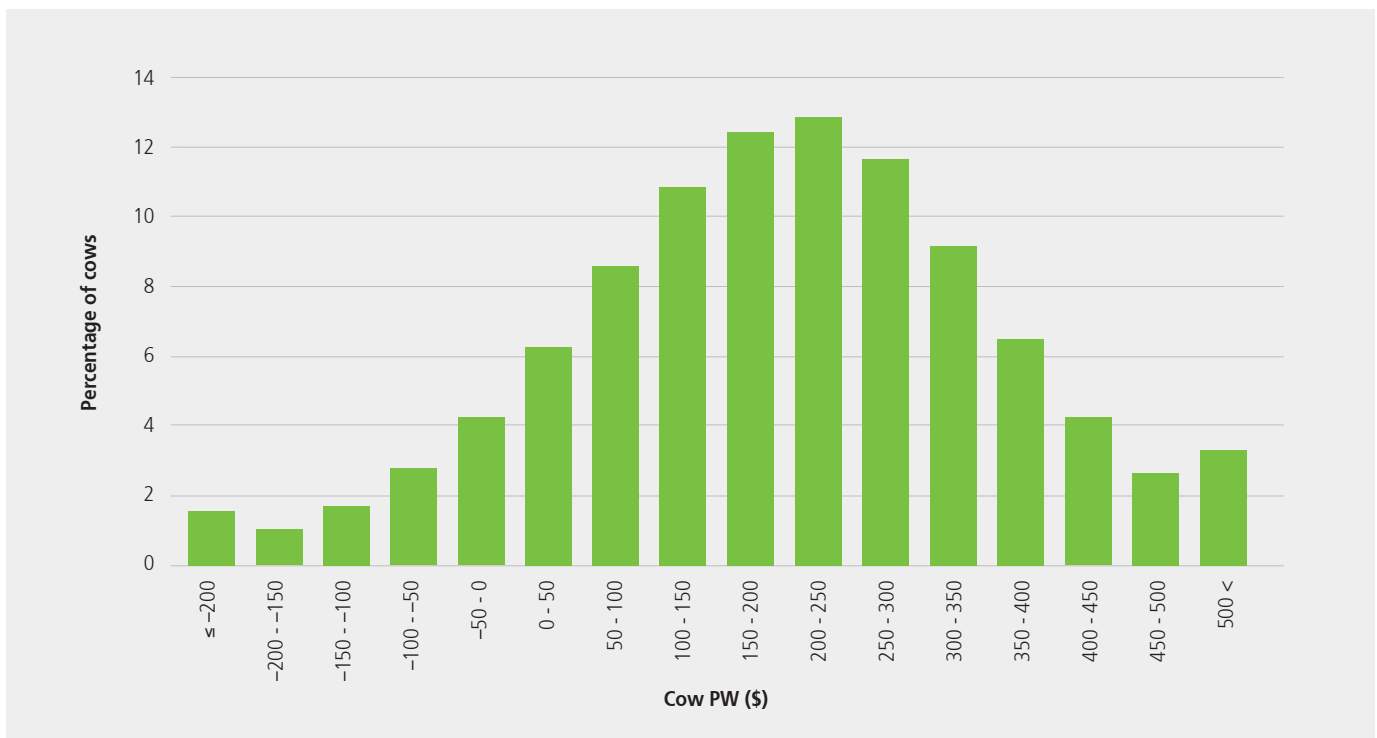
The Production Worth (PW) for cows presented below (Table 4.20 and Graph 4.20) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2021/22 season. Table 4.20 shows that 50% of these cows had a PW of 201.9 or above and that 25% of these cows had a PW of 304.8 or above.

Table 4.20: Cow Production Worth in 2021/22

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Cow PW	201.9	>466.3	>403.1	>304.8	<93.6	<-15.0	<-87.6

(Evaluation date: 28 May 2022)

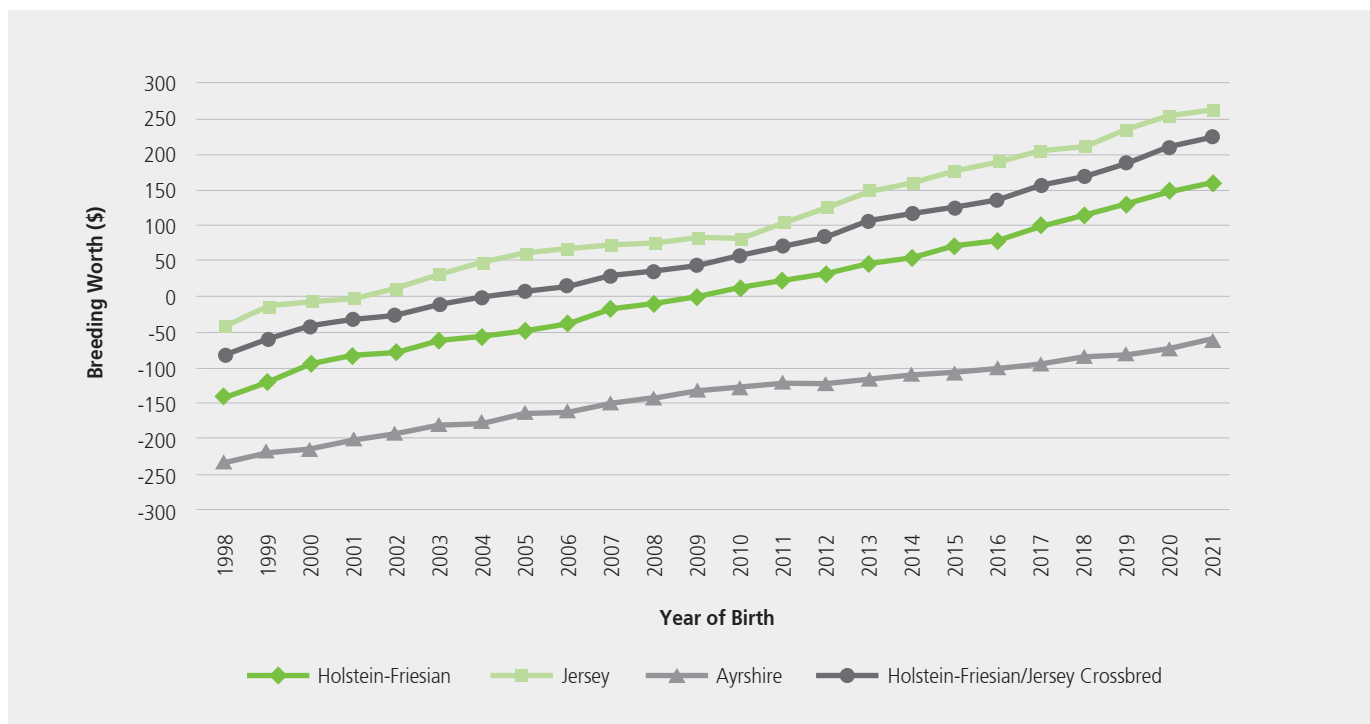
Graph 4.20: Distribution of Cow Production Worth in 2021/22



(Evaluation date: 28 May 2022)

The genetic trend for cows is based on all cows (alive or dead) recorded on the Livestock Improvement Database as of 28 May 2022. Also included are the estimated BW and PW for replacement stock (2020 and 2021 born animals). All evaluations can be compared across breeds. The genetic trend for BW by breed is presented in Graph 4.21. The Breeding Worth for all breed categories has increased over time.

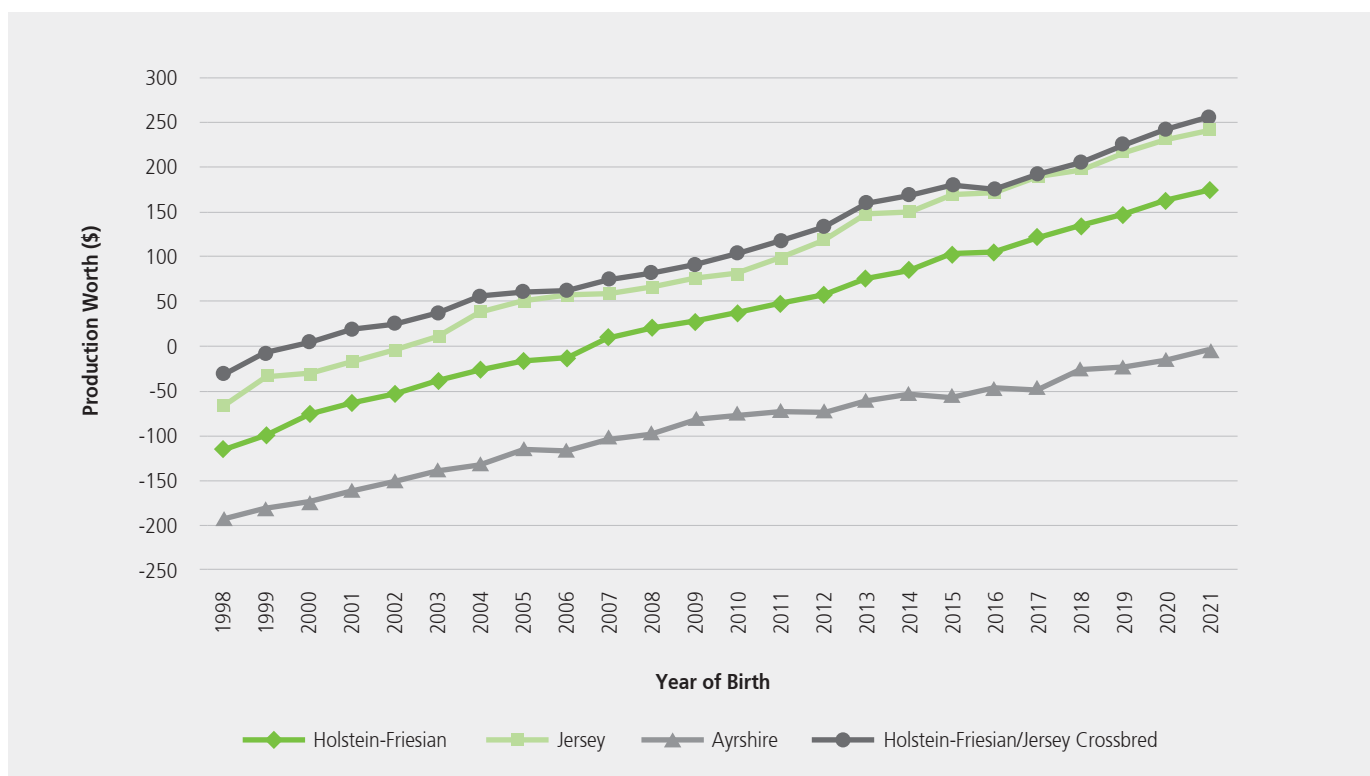
**Graph 4.21: Trend in Breeding Worth for all cows**



(Evaluation date: 28 May 2022)

The trend for PW by breed is presented in Graph 4.22. The increasing value of protein has resulted in a favourable outcome for crossbred animals with the additional value of heterosis (hybrid vigour) also expressed in PW for crossbred animals.

**Graph 4.22: Trend in Production Worth for all cows**



(Evaluation date: 28 May 2022)

Table 4.21 shows the average BVs and BW by breed category, of all current 2019 born cows. The Jersey cows had the highest average BW at 241.9. Holstein Friesian cows had the highest milkfat, protein, and milk volume BVs. All evaluations are comparable across breeds.

**Table 4.21: Average Breeding Worth and Breeding Values of all current cows born in 2019 by breed category.**

Breed	BW \$	Milkfat BV (kg)	Protein BV (kg)	Milk Volume BV (l)	Liveweight BV (kg)	Somatic Cell BV (score)	Fertility BV (%)	Body Cond. Score (score)	Functional Survival BV (%)	Udder Overall BV (unit)	Cow Numbers
Holstein-Friesian	135.9	20.5	25.7	628	40.4	0.05	-0.8	0.00	1.3	0.297	203,069
Jersey	241.9	16.5	5.0	-339	-47.1	-0.13	1.3	-0.01	1.4	0.300	61,391
Ayrshire	-77.4	-1.1	3.6	216	18.4	-0.19	-8.1	-0.08	0.4	0.136	3,587
HF/J Crossbred	192.9	20.3	19.4	260	4.4	0.00	0.3	-0.01	1.3	0.234	530,211
Guernsey	-276.3	-22.8	-18.2	-493	20.2	0.02	-5.8	-0.14	-4.5	-0.312	53
Milking Shorthorn	-208.9	-19.5	-7.0	-155	20.2	-0.07	-3.8	-0.08	-3.2	-0.229	119
Brown Swiss	-220.7	-17.7	-2.4	-80	34.9	-0.35	-12.3	-0.01	-1.0	-0.108	100
Other	146.9	15.5	16.3	214	8.1	-0.05	-0.7	-0.02	0.8	0.168	62,263
<b>Weighted Average</b>	<b>178.4</b>	<b>19.6</b>	<b>19.6</b>	<b>300.3</b>	<b>9.6</b>	<b>0.00</b>	<b>0.0</b>	<b>-0.01</b>	<b>1.3</b>	<b>0.248</b>	<b>860,793</b>

(Evaluation date: 28 May 2022)

Survivability is measured by the percentage of cows that have a lactation recorded for consecutive years. In the 2021/22 season, survivability was higher than the previous year for all reported age groups except for two-three-year-olds which was about the same as it was in the 2020-2021 season.

The value in the "2-3 years" column is the percentage of cows that were milking as two-year-olds in the 2020/21 season and are now milking as three-year-olds in the 2021/22 season. Table 4.22 shows that for the 2021/22 season the highest percentage of survival is in animals aged 2-3 years (88.6%), followed by animals aged 3-4 years (86.4%) and 4-5 years (84.9%).

**Table 4.22: Survivability percentages since 1996/97**

Season	Percentage (%) of age group surviving to next lactation						
	2-3 years	3-4 years	4-5 years	5-6 years	6-7 years	7-8 years	8-9 years
1996/97	84.9	85.1	84.8	81.6	78.2	74.2	69.0
1997/98	85.9	86.7	85.6	81.9	77.7	73.9	68.3
1998/99	84.5	86.1	85.8	83.0	80.0	75.5	70.5
1999/00	84.1	86.2	85.8	82.8	80.7	76.3	70.8
2000/01	85.3	86.7	86.5	83.2	80.1	76.5	71.7
2001/02	85.6	88.4	86.8	84.3	80.8	77.1	73.5
2002/03	85.7	85.9	86.6	83.8	80.8	76.0	71.2
2003/04	85.2	86.9	86.0	83.0	78.7	74.8	69.4
2004/05	85.7	87.3	86.7	82.7	79.7	74.6	69.6
2005/06	85.0	87.5	87.6	84.2	79.7	76.7	70.6
2006/07	84.8	87.8	88.2	84.7	79.5	74.9	71.2
2007/08	84.0	87.6	87.2	84.1	80.0	74.9	69.5
2008/09	86.8	87.7	87.5	83.4	80.2	76.1	70.7
2009/10	87.0	87.2	86.3	82.2	77.6	72.9	67.3
2010/11	86.2	87.2	86.0	81.1	76.8	71.2	65.7
2011/12	87.3	87.7	86.8	81.5	76.8	72.2	65.6
2012/13	87.6	89.2	87.9	82.7	77.9	71.6	66.1
2013/14	87.6	87.4	86.3	82.0	77.2	71.5	64.3
2014/15	86.9	85.7	84.7	80.8	75.7	70.5	64.1
2015/16	87.0	87.1	84.2	79.5	74.9	69.1	62.9
2016/17	84.1	84.5	83.4	78.9	74.2	69.1	63.2
2017/18	85.2	85.0	84.1	79.8	73.9	69.6	63.5
2018/19	86.3	85.5	85.0	80.5	75.1	68.8	64.2
2019/20	87.5	85.0	85.0	80.4	75.5	70.5	64.1
2020/21	88.6	85.9	84.3	79.8	74.4	69.8	63.9
2021/22*	88.6	86.4	84.9	80.9	76.3	70.8	65.6

\* As in Table 4.6, some records were not available this season, however the percentages should still be comparable.



## 5. Prices received

### A. Milk prices

Up until the end of the 2000/01 season, dairy farmers received payment from the New Zealand Dairy Board through a system of advance and final payouts via dairy companies. Seasonal supply dairy companies passed on the Dairy Board advance payout to their suppliers, in addition to a margin based on dairy company efficiency, product mix and investment policies; together known as the total payout.

The introduction of the Dairy Industry Restructuring Act 2001 opened the way for New Zealand's largest dairy companies, Kiwi Co-operative Dairy Company (Kiwi) and New Zealand Dairy Group (NZDG) to merge with the Dairy Board to form Fonterra. Further, the Act allowed the smaller dairy companies, such as Tatua and Westland, to remain separate co-operatives. Consequently, the historic payment system became redundant. Tatua is now the last dairy cattle co-operative beside Fonterra, and has established commercial arrangements for sale of dairy products

Payments to seasonal supply farmers are based on the "A+B±C" system, which incorporates payments for milkfat (A) and protein (B) with adjustments for milk volume (C). The payment system for winter milk supply varies between companies. Some winter milk payment systems are based on the milk volume only, whereas other payment systems are similar to seasonal supply payment systems, which incorporate components of milkfat, protein, and volume.

- **\$9.52 average dairy co-operative payout**

The weighted average dairy co-operative total payout (per kilogram of milksolids) received by dairy farmers from seasonal supply milk is shown in Table 5.1 (weightings are based on the number of herds supplying each dairy co-operative). The average payout is given in both nominal and inflation-adjusted dollars using the Consumers Price Index (CPI) provided by Statistics New Zealand. The average dairy co-operative payout of \$9.52 per kg milksolids in 2021/22 was higher than the previous season (\$7.76) and the highest average payout on record. It is \$2.76 above the decade average payout for milksolids which sits at \$6.76.

However, when accounting for inflation, it is only the fourth highest payout on record.

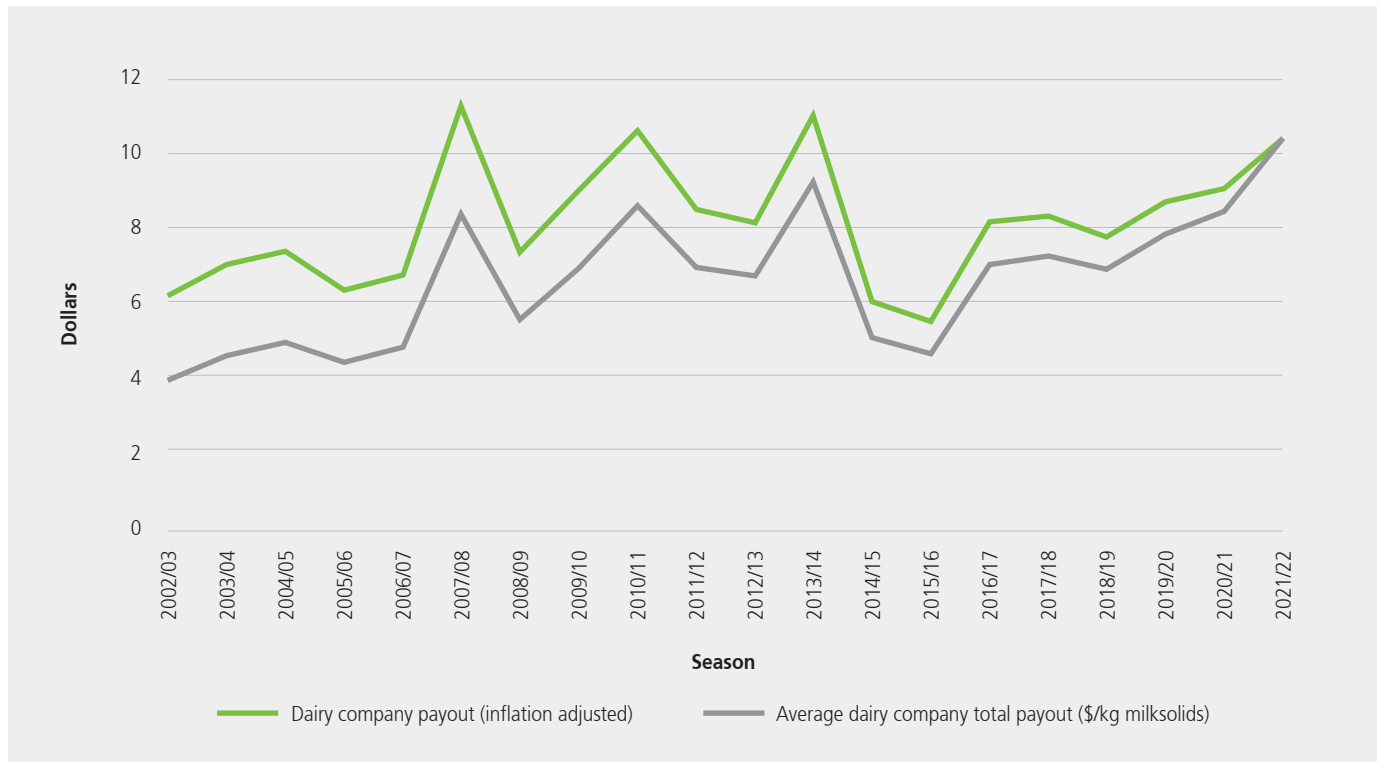
**Table 5.1: Trend in prices received for milksolids for the last 20 seasons**

Season	Average Dairy Co-operative total payout (\$/kg milksolids)	Dairy Co-operative payout (inflation-adjusted) <sup>a</sup>
2002/03	3.66	5.70
2003/04	4.25	6.47
2004/05	4.58	6.78
2005/06	4.10	5.84
2006/07	4.46	6.22
2007/08	7.67	10.30
2008/09	5.14	6.77
2009/10	6.37	8.25
2010/11	7.89	9.70
2011/12	6.40	7.80
2012/13	6.18	7.48
2013/14	8.47	10.09
2014/15	4.69	5.56
2015/16	4.30	5.08
2016/17	6.47	7.51
2017/18	6.68	7.64
2018/19	6.35	7.14
2019/20	7.21	7.99
2020/21	7.76	8.33
2021/22	9.52	9.52

<sup>a</sup> Weighted to give real dollar values using the Consumers Price Index for the end of the June quarter. Sourced from Statistics New Zealand; excludes dairy co-operative retentions and deduction for DairyNZ Levy.

**Note:** From 2009/10 to 2018/19 average dairy co-operative payout was from Fonterra, Tatua, and Westland. From 2019/20 it is from Fonterra & Tatua. This includes Fonterra dividend payments.

Graph 5.1: Trend in milksolids payout to dairy farmers for the last 20 seasons



## B. Dairy farm land prices

- Dairy farm sale numbers increase slightly
- Inflation-adjusted average dairy farm land price at a 10-year low

Prior to 2011/12 Table 5.2 was computed using data from Quotable Value (QV) on a calendar year basis. Dairy farm land sales are now based on data provided by the Real Estate Institute of New Zealand (REINZ) on a seasonal basis. Up until the 2019/20 season, raw data provided by REINZ was weighted by the number of farms in each region. From the 2019/20 season onwards, data is no longer weighted due to changes in the way data is provided by REINZ. The new method produces values that are consistent with changes observed and past season figures. The farms sold are considered to be economic units.

The weighted average sale price of dairy farms decreased to \$4.80 million in 2021/22 from the previous season (\$4.81 million) (Table 5.2). When accounting for inflation, this dairy farm land price is at a 10-year low.

Farms sold were 14 hectares smaller on average than sales in 2020/21. The weighted average sale price per hectare of \$34,427 increased by 9.7% on the previous season.

**Table 5.2: Trend in dairy land sale values for the past ten seasons**

Season	Number of dairy farms sold	Weighted * average sale price (\$)	Inflation adjusted average sale price (\$)	Weighted * average land area (ha)	Weighted * average sale price/ha (\$)	Inflation adjusted average sale price/ha (\$)	Weighted * average sale price/KgMS (\$)	CPI
2012/13	197	4,375,251	5,296,837	130	33,557	40,625	36	959
2013/14	312	5,174,010	6,161,052	142	36,369	43,307	42	975
2014/15	244	5,228,018	6,199,927	132	39,577	46,935	44	979
2015/16	192	5,381,697	6,356,205	169	36,557	43,177	39	983
2016/17	217	4,808,676	5,582,873	151	37,835	43,926	40	1,000
2017/18	226	4,935,487	5,645,420	130	38,015	43,483	40	1,015
2018/19	148	5,125,837	5,766,567	144	36,846	41,452	38	1,032
2019/20	113	4,451,927	4,936,664	133	33,410	37,048	37	1,047
2020/21	198	4,810,641	5,161,880	153	31,393	33,685	35	1,082
2021/22	200	4,800,278	4,800,278	139	34,427	34,427	35	1,161

Source: Real Estate Institute of New Zealand (REINZ), Statistics New Zealand, DairyNZ

Note: Number of dairy farms sold is for a season (01-Jun to 31-May) and excludes support blocks and non-economic units.

\* pre-2019/20 figures have been weighted by the number of dairy farms in each region. From 2019/20 onwards, figures have not been weighted.

## 6. Disease Control

### A. Tuberculosis (Tb) control

Control of *Mycobacterium bovis* (Tb) over the agricultural industry is managed by TBfree New Zealand, whose primary objective is to manage Tb to reduce the number of infected herds and to prevent Tb vector free areas becoming vector risk areas. The status of a vector area is determined by the prevalence of wild animals (e.g., possums and ferrets) that are considered a source of infection.

The number of infected dairy herds in 2021/22 was 12 (Table 6.1). The number of tuberculous dairy cattle increased to 42 from the 29 in 2020/21. This exceeds totals from the past four seasons; however, it is still well below the 10-year average of 78.

The West Coast had the greatest number of infected herds (10) in 2021/22, as well as the greatest number of Tuberculous dairy cattle (38).

**Table 6.1: Tuberculosis (Tb) testing and results in 2021/22**

Region	Vector Status	Number of Infected Dairy Herds at 30 June 2021	Number of Dairy Cattle Primary Tested in 2021/22	Number of Tuberculous Dairy Cattle
Northland	Free	0	42,805	0
Auckland	Free	0	9,531	0
Waikato	Free	0	317,216	1
	Risk	0	30,022	0
Bay of Plenty	Free	0	36,412	0
	Risk	0	20,594	0
Gisborne	Free	0	360	0
Hawke's Bay	Free	0	17,685	0
	Risk	1	25,108	1
Taranaki	Free	0	58,639	0
Manawatu/Wanganui	Free	0	41,405	0
	Risk	1	10,650	2
Wellington	Free	0	0	0
	Risk	0	57,945	0
North Island	Free	0	524,053	1
	Risk	2	144,319	3
<b>North Island</b>	<b>Total</b>	<b>2</b>	<b>668,372</b>	<b>4</b>
Marlborough	Free	0	1,379	0
	Risk	0	2,249	0
Tasman/Nelson	Free	0	14,852	0
	Risk	0	8,036	0
West Coast	Free	0	8,059	0
	Risk	10	216,146	38
Canterbury	Free	0	137,572	0
	Risk	0	91,544	0
Otago	Free	0	69,998	0
	Risk	0	112,310	0
Southland	Free	0	109,314	0
	Risk	0	40,677	0
South Island	Free	0	341,174	0
	Risk	10	470,962	38
<b>South Island</b>	<b>Total</b>	<b>10</b>	<b>812,136</b>	<b>38</b>
New Zealand	Free	0	865,227	1
	Risk	12	615,281	41
<b>New Zealand</b>	<b>Total</b>	<b>12</b>	<b>1,480,508</b>	<b>42</b>

Sourced from TBfree New Zealand

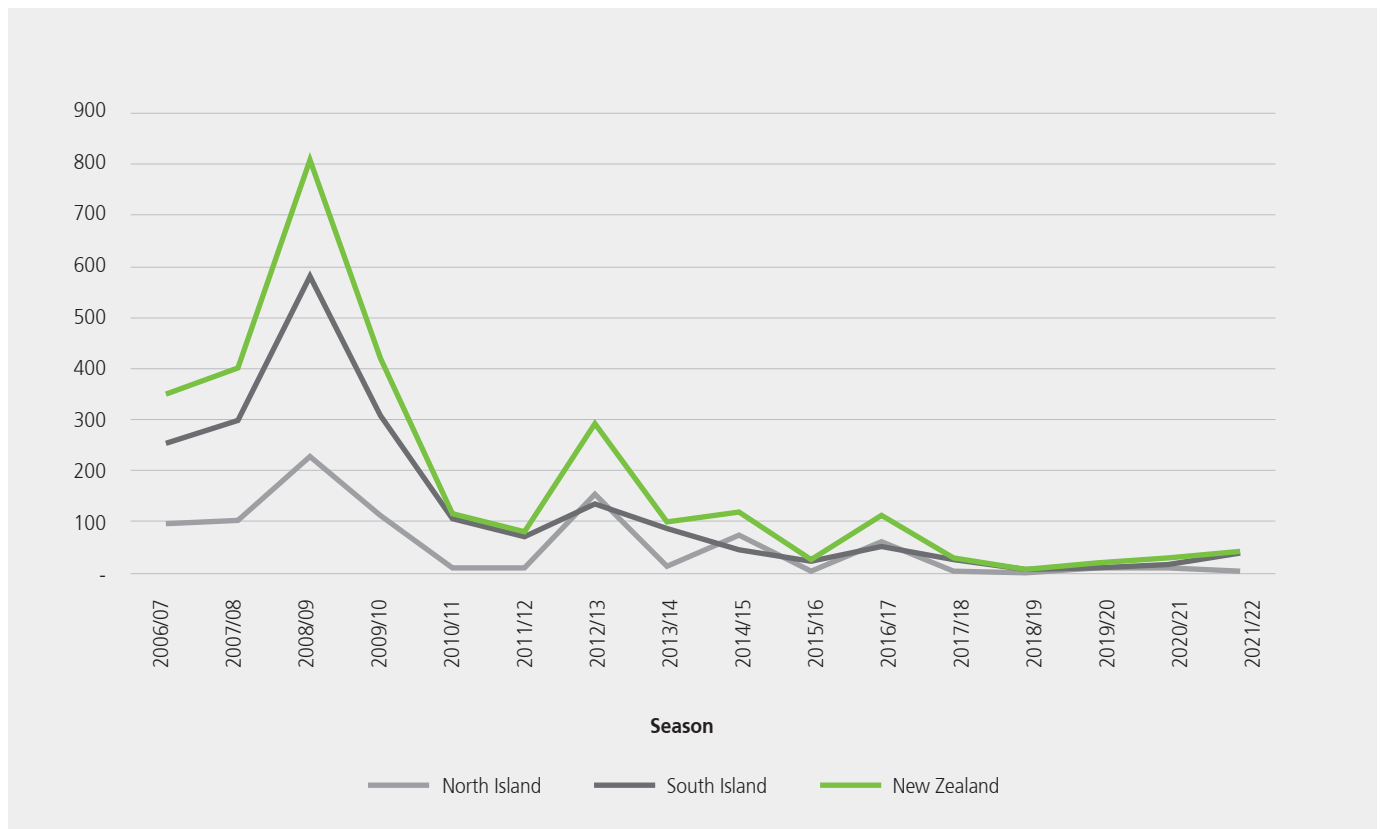
<sup>a</sup> Tuberculous animals include lesioned reactor cattle and lesioned cull cattle

The trend in the number of infected herds, by island and for the country as a whole, is presented in Graph 6.1. Nationally, the past 15 seasons has seen an 81.2% decrease in the number of infected herds. The overall number of infected animals has also decreased (89.5%) over the same period (Graph 6.2).

**Graph 6.1: Trend in the number of infected herds since 2006/07**



**Graph 6.2: Trend in the number of tuberculous dairy cattle since 2006/07**



## Appendix 1: Farming regions and districts

The following map shows the farming regions used in all analyses presented in this report. The list of districts, which follow local authority boundaries (except in Auckland, Christchurch and Banks Peninsula), within each region is also given.

### 1 Northland

Far North  
Whangarei  
Kaipara

### 2 Auckland

Rodney  
North Shore  
Waitakere  
Auckland  
Manukau  
Papakura  
Franklin

### 3 Waikato

Thames/Coromandel  
Hauraki  
Waikato  
Matamata/Piako  
Hamilton  
Waipa  
Otorohanga  
South Waikato

### 4 Bay of Plenty

Western Bay of Plenty  
Tauranga  
Whakatane  
Kawerau  
Opotiki

### 5 Central Plateau

Rotorua  
Taupo

### 6 Western Uplands

Waitomo  
Ruapehu

### 7 East Coast

Gisborne  
Wairoa

### 8 Hawkes Bay

Hastings  
Napier  
Central Hawkes Bay

### 9 Taranaki

New Plymouth  
Stratford  
South Taranaki

### 10 Manawatu

Wanganui  
Rangitikei  
Manawatu  
Palmerston North  
Horowhenua  
Kapiti  
Porirua  
Upper Hutt  
Lower Hutt  
Wellington

### 11 Wairarapa

Tararua  
Masterton  
Carterton  
South Wairarapa

### 12 Nelson/Marlborough

Tasman  
Nelson  
Marlborough  
Kaikoura

### 13 West Coast

Buller  
Grey  
Westland

### 14 North Canterbury

Hurunui  
Waimakariri  
Christchurch  
Banks Peninsula  
Selwyn  
Ashburton

### 15 South Canterbury

Timaru  
Mackenzie  
Waimate

### 16 Otago

Waitaki  
Central Otago  
Queenstown/Lakes  
Dunedin  
Clutha

### 17 Southland

Southland  
Gore  
Invercargill

