

New Zealand Dairy Statistics 2007-08



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1. Introduction

The purpose of New Zealand Dairy Statistics is to provide statistical information related to the New Zealand Dairy Industry. Funding is provided by Livestock Improvement Corporation (LIC) and DairyNZ Incorporated (dairy farmer levy). Contributors include New Zealand Animal Evaluation Limited.

Data is sourced from the LIC National Database, dairy companies, Animal Evaluation database, Animal Health Board Annual Report (year ending 30 June 2008), Quotable Value New Zealand Rural Property Sales Statistics, and Statistics New Zealand.

New Zealand Dairy Statistics 2007/08 is a report that shows historical information up to and including the 2007/08 season. Data for previous years were released under *Dairy Statistics* from 1998, *Annual Report (Livestock Improvement Division)* in 1987/88, *Livestock Improvement Report* from 1984/85 to 1986/87, and *New Zealand Dairy Board Farm Production Report* up to 1983/84.

Prior to 1991/92 the information for the *Dairy Statistics* publication was obtained primarily from the analysis of the New Zealand Dairy Industry Cow Census (an annual survey of all dairy farmers). The 1991/92 Dairy Statistics publication was a transition year for which only minimal data was available.

As of March 2002, LIC became a user-owned co-operative, with responsibility for farm production activities and, in particular, dairy herd improvement and herd records. LIC's activities can broadly be described as genetics, information and advice. Services provided to farmers include farm management information, herd testing and artificial breeding services, DNA analysis, a farm advisory service, research to improve farm profitability, statistical information related to the New Zealand dairy industry, and herd recording on the LIC Database.

2. National dairy statistics

A. Industry statistics

i) Production

- 3.5% reduction in milksolids processed

In 2007/08, dairy companies processed 14.7 billion litres of milk containing 1.27 billion kilograms of milksolids (see Table 2.1). Total milksolids processed declined 3.5% from the 1.32 billion kilograms processed in the previous season, due to summer/autumn drought conditions experienced in many regions.

Table 2.1: Summary of milk production statistics since 1998/99

Season	Milk processed (million litres)	Milkfat processed (million kgs)	Protein processed (million kgs)	Milksolids processed (million kgs)
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

Note: Prior to Dairy Statistics 2002/03, 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, Table 2.1 now includes all milk processed by New Zealand dairy companies, including milk for the domestic market.

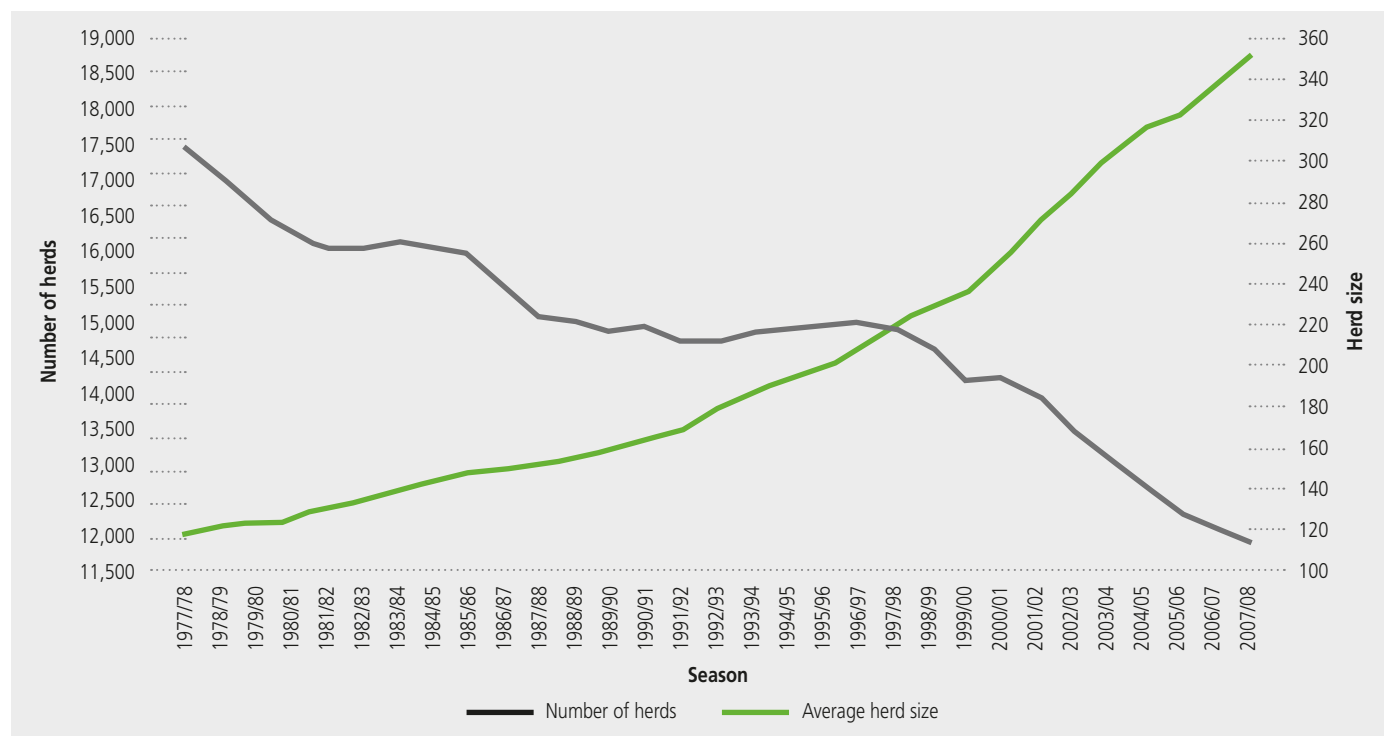
ii) Population

- Number of herds continues to decline
- Average herd size now 351
- Cow numbers increase by 96,000 to over 4 million cows

Since 1974/75 total herd numbers have declined at a rate of 215 herds per year (Graph 2.1). The total number of herds in the 2007/08 season dropped by 194, to 11,436, compared with the previous season. This is the seventh consecutive year of declining herd numbers.

Average herd size increased to 351 in 2007/08, continuing the consistent upward trend for the last 30 seasons. The average herd size has more than doubled in the last twenty years.

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



The total cow population increased in the 2007/08 season to 4.013 million (Table 2.2), an increase of 2.5%. Average effective hectares increased to 126 hectares. An average of 2.83 cows per hectare is the highest stocking rate recorded. Total effective hectares (runoff excluded) were 1.44 million.

Table 2.2: Summary of herd statistics since 1974/75

Season	Herds	Total cows	Total effective hectares	Average herd size	Average effective hectares ^a	Average cows per hectare ^a
1974/75	18,540	2,079,886	-	112	-	-
1975/76	18,442	2,091,950	-	113	-	-
1976/77	17,924	2,074,443	-	116	-	-
1977/78	17,363	2,052,624	-	118	-	-
1978/79	16,907	2,039,902	-	121	-	-
1979/80	16,506	2,045,808	-	124	-	-
1980/81	16,089	2,027,096	-	126	-	-
1981/82	15,821	2,060,898	-	130	63	2.10
1982/83	15,816	2,128,199	-	135	64	2.20
1983/84	15,932	2,209,725	-	139	65	2.20
1984/85	15,881	2,280,273	-	144	64	2.40
1985/86	15,753	2,321,012	-	147	64	2.40
1986/87	15,315	2,281,849	-	149	65	2.40
1987/88	14,818	2,236,290	-	151	65	2.40
1988/89	14,744	2,269,073	-	154	66	2.40
1989/90	14,595	2,313,822	-	159	67	2.40
1990/91	14,685	2,402,145	-	164	70	2.40
1991/92	14,452	2,438,641	-	169	-	-
1992/93	14,458	2,603,049	-	180	74	2.50
1993/94	14,597	2,736,452	-	188	77	2.50
1994/95	14,649	2,830,977	-	193	80	2.48
1995/96	14,736	2,935,759	-	199	82	2.50
1996/97	14,741	3,064,523	-	208	86	2.50
1997/98	14,673	3,222,591	-	220	87	2.60
1998/99	14,362	3,289,319	-	229	91	2.70
1999/00	13,861	3,269,362	-	236	93	2.67
2000/01	13,892	3,485,883	1,329,173	251	96	2.66
2001/02	13,649	3,692,703	1,404,930	271	103	2.67
2002/03	13,140	3,740,637	1,463,281	285	111	2.61
2003/04	12,751	3,851,302	1,421,147	302	111	2.75
2004/05	12,271	3,867,659	1,411,594	315	115	2.78
2005/06	11,883	3,832,145	1,398,966	322	118	2.77
2006/07	11,630	3,916,812	1,412,925	337	121	2.81
2007/08	11,436	4,012,867	1,436,549	351	126	2.83

- Not available

^a 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 on those cows lactating on 31 December. This change in method has had a small effect on reported cow numbers.

B. Herd production statistics

• Production per herd, per hectare and per cow down on last season

Herd production has typically increased since 1992/93 (Table 2.3). An exception was evident in 1998/99, where production dropped markedly due to unfavourable weather conditions. Similarly, production in 2007/08 also dropped due to drought conditions. Average milksolids per effective hectare (873 kg) was 6.5% lower compared with the previous season (934 kg). Production per cow also decreased in 2007/08 to an average of 307 kg milksolids (comprising 175 kg milkfat and 132 kg protein).

Table 2.3: Summary of herd production since 1974/75

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
1974/75 ^a	-	14,400	-	-	-	-	-	-	128	-	-
1975/76 ^a	-	15,700	-	-	-	-	-	-	137	-	-
1976/77 ^a	-	16,600	-	-	-	-	-	-	143	-	-
1977/78 ^a	-	15,700	-	-	-	-	-	-	131	-	-
1978/79 ^a	-	17,500	-	-	-	-	-	-	142	-	-
1979/80 ^a	-	19,000	-	-	-	-	-	-	151	-	-
1980/81 ^a	-	18,864	-	-	-	-	-	-	147	-	-
1981/82 ^a	-	19,090	-	-	310	-	-	-	144	-	-
1982/83 ^a	-	19,600	-	-	312	-	-	-	143	-	-
1983/84 ^a	-	21,618	-	-	345	-	-	-	154	-	-
1984/85 ^a	-	22,190	-	-	359	-	-	-	152	-	-
1985/86 ^a	-	23,489	-	-	379	-	-	-	157	-	-
1986/87 ^a	-	20,885	-	-	331	-	-	-	138	-	-
1987/88 ^a	-	23,500	-	-	374	-	-	-	154	-	-
1988/89 ^a	-	22,442	-	-	340	-	-	-	143	-	-
1989/90 ^a	-	23,578	-	-	352	-	-	-	147	-	-
1990/91 ^a	-	24,495	-	-	351	-	-	-	148	-	-
1991/92 ^b	-	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

- Not available

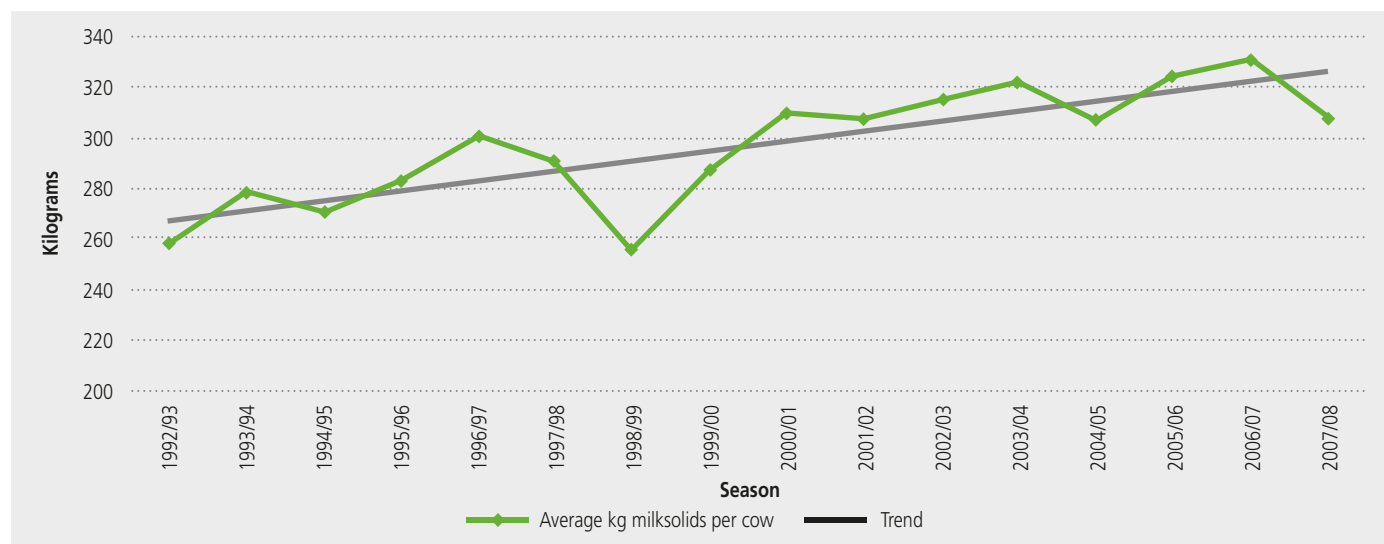
^a Figures prior to 1991/92 exclude town milk herds

^b 1991/92 figures include some town milk herds

i) Production per cow

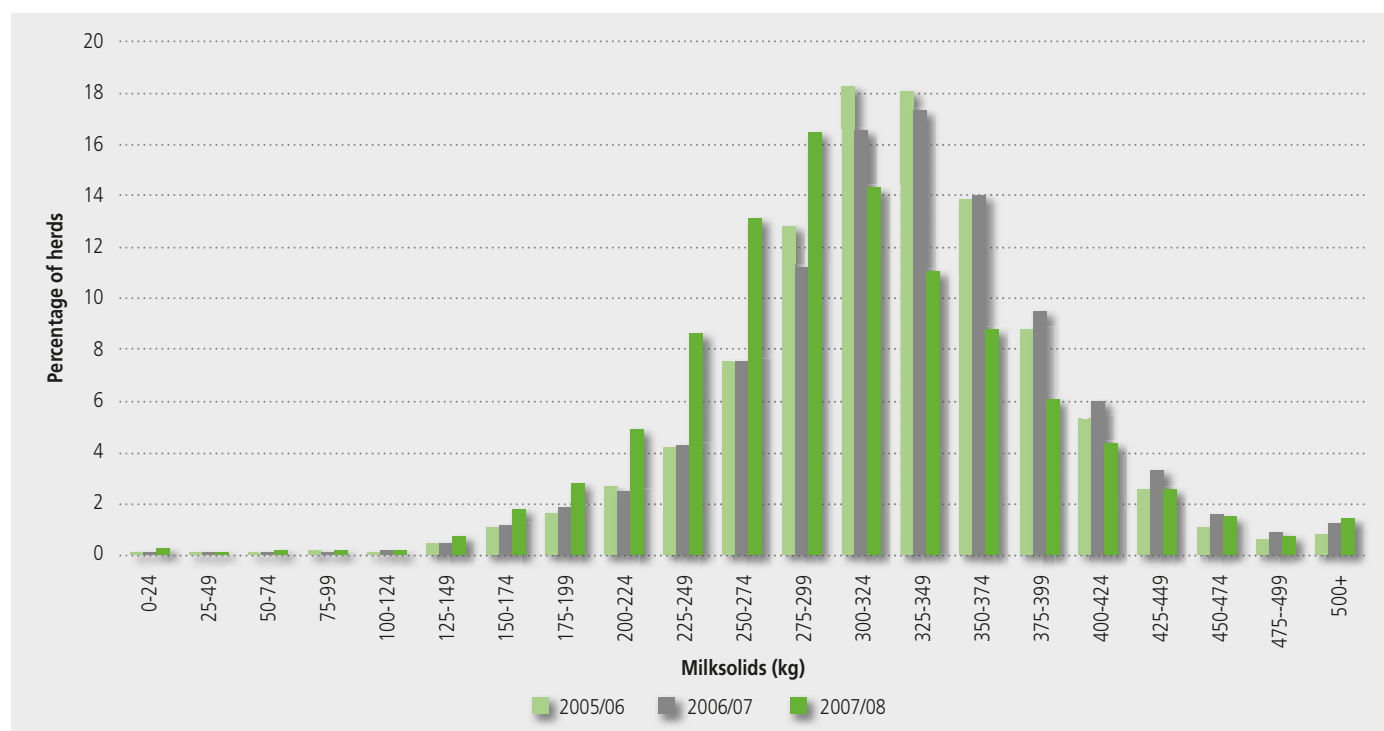
The trend of increased milksolids production per cow over the last several years (Graph 2.2) is partly due to genetic gain and improvements in farm management. These improvements from season to season are masked by the considerable effect of the weather on each season's actual production. For example, unfavourable weather conditions in 1998/99 caused production per cow to fall to its lowest level since 1992/93. Unfavourable summer/autumn drought conditions account for the drop in production for the 2007/08 season.

Graph 2.2: Trend in milksolids production per cow since 1992/93



Average production per cow varies considerably from farm to farm. The variation is caused by many factors, including geographic location, rainfall, soil fertility, stocking rate, genetic merit of the herd and farm management practice. Graph 2.3 shows that the percentage of herds producing less than 300 kg milksolids was higher in the 2007/08 season than in the 2006/07 season due to drought conditions in some regions.

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



ii) Herd size distribution

- 19% of herds have 500 or more cows
- Herds with between 850 and 899 cows have highest production per cow

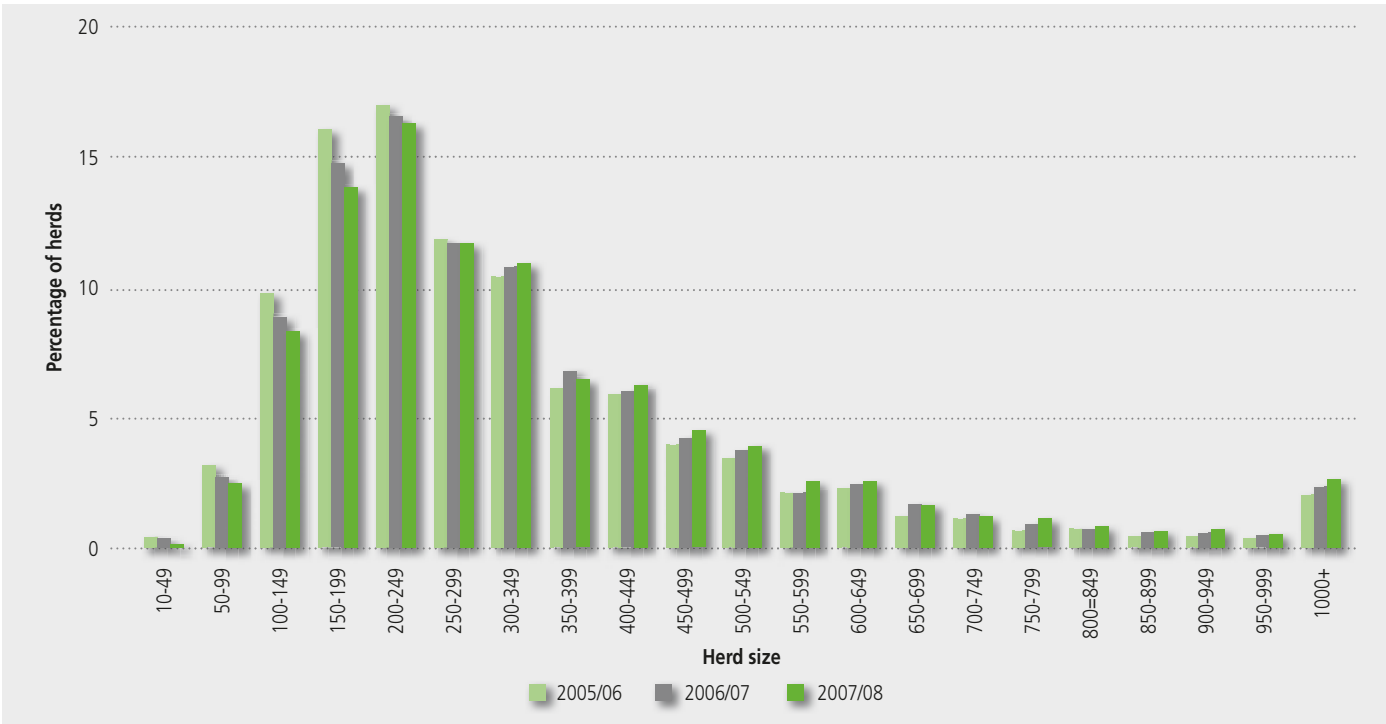
Sixteen percent (1,866) of herds have between 200 and 249 cows (see Table 2.4). Sixty-one percent of all herds have between 100 and 349 cows. In 2007/08, 5,389 herds (47%) had 300 or more cows, and 2,150 (18.8%) had 500 or more cows. Average milkfat, protein and milksolids per cow by herd size are also included in Table 2.4. Average milksolids per cow varies between 218 kg (herds with 50-99 cows) and 356 kg (herds with 850-899 cows).

Table 2.4: Average production per cow by herd size in 2007/08

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	14	0.1	555	0.0	162	122	283
50-99	291	2.5	22,976	0.6	124	94	218
100-149	952	8.3	118,472	3.0	160	120	280
150-199	1,582	13.8	273,205	6.8	168	126	294
200-249	1,866	16.3	412,701	10.3	172	129	301
250-299	1,342	11.7	360,102	9.0	176	132	307
300-349	1,250	10.9	399,259	9.9	177	133	310
350-399	749	6.5	275,947	6.9	181	136	317
400-449	722	6.3	302,184	7.5	183	139	322
450-499	518	4.5	242,590	6.0	185	140	325
500-549	454	4.0	234,577	5.8	190	145	335
550-599	294	2.6	166,707	4.2	189	144	333
600-649	297	2.6	182,538	4.5	190	144	334
650-699	197	1.7	131,509	3.3	196	151	347
700-749	144	1.3	102,817	2.6	187	144	332
750-799	130	1.1	99,317	2.5	186	143	329
800-849	98	0.9	79,730	2.0	192	147	339
850-899	80	0.7	69,180	1.7	200	156	356
900-949	86	0.8	78,472	2.0	184	142	325
950-999	59	0.5	56,938	1.4	181	139	320
1000+	311	2.7	403,091	10.0	179	139	318
Total/Avg	11,436		4,012,867		175	132	307

The herd size distribution presented in Graph 2.4 shows an increase in larger herds (400+ cows) and a decrease in herds with fewer than 250 cows over the last three seasons. The most common herd size continues to range between 200 and 249 cows.

Graph 2.4: Herd size distribution for the last three seasons

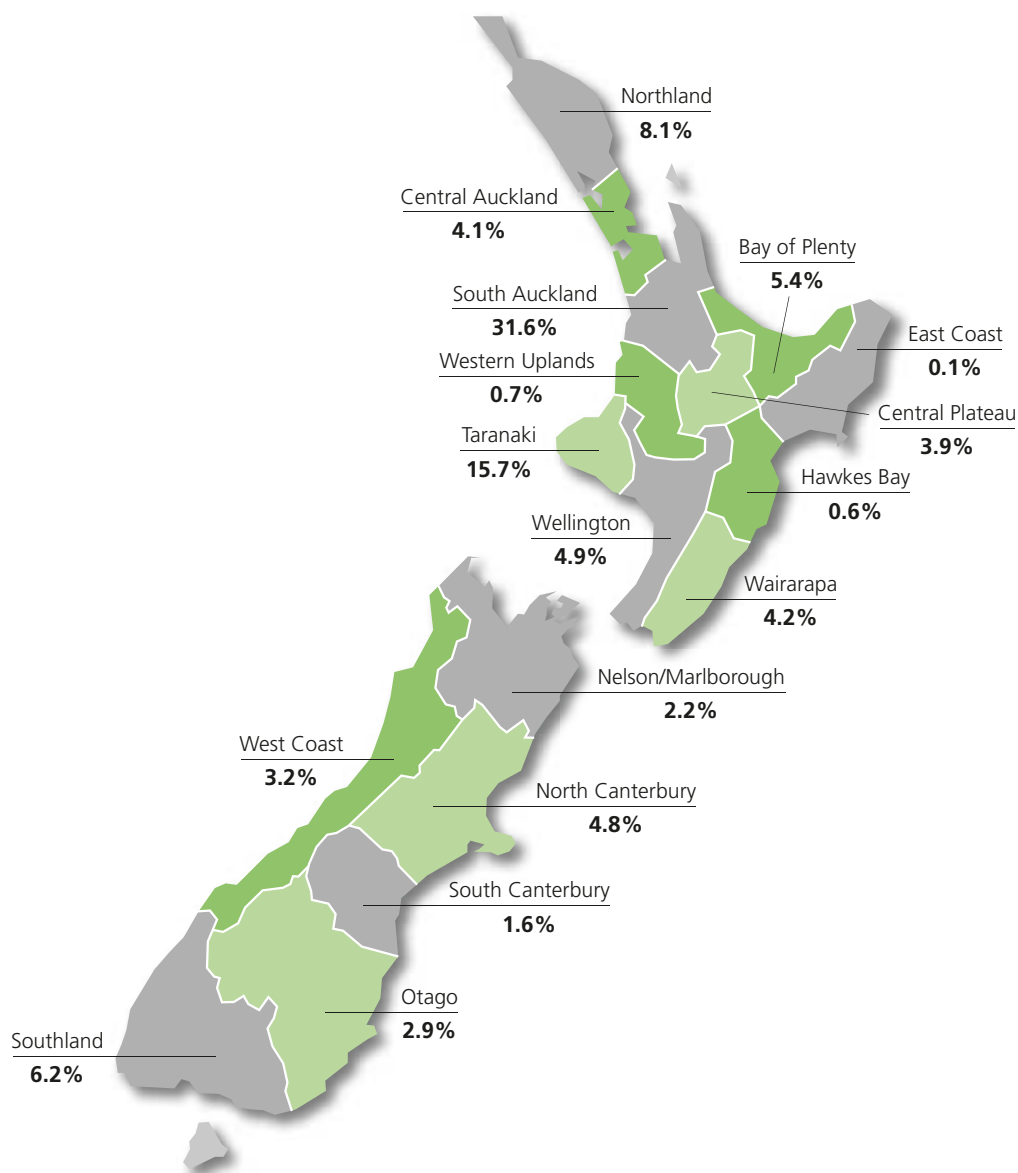


3. Regional dairy statistics

- *One third of all dairy herds are located in the South Auckland region*

The vast majority of dairy herds (79%) are located in the North Island, with the greatest concentration (32%) situated in the South Auckland region. Taranaki, with 16% of dairy herds, is the next most heavily populated region. South Island dairy herds account for 21% of the national total, but have 31% of the cows. The distribution of dairy herds within regions of each island in 2007/08 (Graph 3.1) has remained similar to previous seasons.

Graph 3.1: Regional distribution of dairy herds in 2007/08



- Over 1.2 million cows in the South Island
- Largest average herd size (711) in South Canterbury
- Average herd size in the South Island continues to increase

Farms in the South Island are, on average, larger than those in the North Island, in terms of both farm area and cow numbers. The overall number of herds in New Zealand (11,436) has dropped compared with the previous season (Table 3.1). Sixty-nine percent of the total cows are in the North Island, with 27% in the South Auckland region. The average herd size in both islands continues to increase. Within the South Island, North and South Canterbury has the largest average herd sizes (710 and 711 cows respectively). In the North Island, Hawkes Bay has the largest average herd size of 577 cows. The smallest herd averages are in Central Auckland, Taranaki and Northland, averaging 240, 265 and 285 cows respectively. North Canterbury has the highest average cows per hectare (3.28), followed by South Canterbury (3.23) and South Auckland (3.03). The regions with the lowest average cows per hectare are found in Northland (2.24) and the West Coast (2.31).

Table 3.1: Herd analysis by region in 2007/08

Farming region	Number of herds	Percentage of herds	Number of cows	Percentage of cows	Number of effective hectares	Percentage of effective hectares	Average herd size	Average effective hectares	Average cows per hectare
Northland	928	8.1	264,460	6.6	118,660	8.3	285	128	2.24
Central Auckland	471	4.1	113,013	2.8	46,361	3.2	240	98	2.46
South Auckland	3,613	31.6	1,078,026	26.9	363,180	25.3	298	101	3.03
Bay of Plenty	618	5.4	191,561	4.8	67,399	4.7	310	109	2.90
Central Plateau	443	3.9	214,114	5.3	80,989	5.6	483	183	2.73
Western Uplands	77	0.7	32,003	0.8	12,390	0.9	416	161	2.64
East Coast	12	0.1	3,893	0.1	1,649	0.1	324	137	2.46
Hawkes Bay	64	0.6	36,910	0.9	12,952	0.9	577	202	2.78
Taranaki	1,793	15.7	474,626	11.8	168,281	11.7	265	94	2.86
Wellington	556	4.9	190,203	4.7	69,145	4.8	342	124	2.76
Wairarapa	475	4.2	158,496	3.9	58,530	4.1	334	123	2.73
North Island	9,050	79.1	2,757,305	68.7	999,536	69.6	305	110	2.82
Nelson/Marlborough	248	2.2	81,087	2.0	29,930	2.1	327	121	2.78
West Coast	368	3.2	132,598	3.3	59,573	4.1	360	162	2.31
North Canterbury	545	4.8	387,152	9.6	117,082	8.2	710	215	3.28
South Canterbury	184	1.6	130,773	3.3	41,190	2.9	711	224	3.23
Otago	331	2.9	170,629	4.3	59,165	4.1	515	179	2.92
Southland	710	6.2	353,323	8.8	130,073	9.1	498	183	2.72
South Island	2,386	20.9	1,255,562	31.3	437,013	30.4	526	183	2.86
New Zealand	11,436		4,012,867		1,436,549		351	126	2.83

- *Highest average per herd, average per hectare, and average per cow production recorded in North Canterbury*

South Island farms have, on average, higher per herd production than herds in the North Island, with North Canterbury recording the highest average herd production at 267,374 kilograms of milksolids (Table 3.2). This reflects larger herd size. In the North Island, the Hawkes Bay region recorded the highest average herd production of 178,896 kilograms of milksolids.

In 2007/08, average production per effective hectare and 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 (1,259 kg), while Bay of Plenty had the highest average milksolids production per hectare in the North Island (905 kg).

North Canterbury had the highest average milksolids per cow (384 kg). The region with the lowest average milksolids per cow was recorded in Western Uplands (255 kg).

Table 3.2: Herd production analysis by region in 2007/08

<i>Farming region</i>	<i>Average litres per herd</i>	<i>Average kg milkfat per herd</i>	<i>Average kg protein per herd</i>	<i>Average kg milksolids 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	985,104	47,491	35,851	83,342	367	276	644	164	123	287
Central Auckland	795,035	37,573	28,674	66,247	381	291	673	155	118	273
South Auckland	1,013,334	49,670	37,097	86,767	500	372	872	164	123	287
Bay of Plenty	1,151,371	55,373	41,657	97,030	517	388	905	177	133	310
Central Plateau	1,633,384	78,834	58,913	137,747	455	340	795	167	124	291
Western Uplands	1,232,780	60,047	45,279	105,326	386	292	678	145	110	255
East Coast	1,146,474	48,152	39,897	88,049	386	320	706	159	131	290
Hawkes Bay	2,132,469	101,068	77,828	178,896	469	359	828	166	127	293
Taranaki	883,447	46,074	33,896	79,970	494	363	857	172	127	299
Wellington	1,318,300	62,871	48,215	111,086	501	383	885	180	138	318
Wairarapa	1,183,116	58,965	44,246	103,211	476	355	831	173	129	303
North Island	1,050,728	51,670	38,696	90,366	475	355	830	168	125	293
Nelson/Marlborough	1,190,299	59,995	44,617	104,612	519	386	905	185	138	324
West Coast	1,266,286	65,330	48,485	113,815	424	313	736	184	136	321
North Canterbury	3,118,829	150,194	117,180	267,374	707	551	1,259	215	168	384
South Canterbury	3,081,409	148,248	115,692	263,939	686	534	1,221	211	165	376
Otago	2,180,358	103,809	81,147	184,956	602	471	1,073	206	162	368
Southland	2,093,169	101,748	79,426	181,174	564	440	1,004	208	163	371
South Island	2,194,374	106,729	82,695	189,424	585	452	1,037	204	157	361
New Zealand	1,289,337	63,158	47,876	111,033	498	375	873	175	132	307

South Taranaki continues to be the district with the most herds (1,084) and cows (306,250), followed by Matamata-Piako (Table 3.3). Ashburton in North Canterbury has the highest average herd size with 800 cows.

Table 3.3: Herd analysis by district in 2007/08

<i>Region</i>	<i>District</i>	<i>Total herds</i>	<i>Total cows</i>	<i>Total effective hectares</i>	<i>Average herd size</i>	<i>Average effective hectares</i>	<i>Average cows per hectare</i>
Northland	Far North	256	68,640	32,164	268	126	2.14
	Whangarei	313	96,506	40,775	308	130	2.35
	Kaipara	359	99,314	45,721	277	127	2.21
Central Auckland	Rodney	166	41,051	17,509	247	105	2.32
	Manukau City	17	3,722	1,322	219	78	2.81
	Papakura	7	1,081	497	154	71	2.16
	Franklin	281	67,159	27,033	239	96	2.52
South Auckland	Waikato	698	211,630	73,861	303	106	2.93
	Hamilton City	12	3,013	983	251	82	3.08
	Waipa	582	186,771	60,020	321	103	3.14
	Otorohanga	384	123,834	43,258	322	113	2.93
	Thames-Coromandel	90	22,398	8,561	249	95	2.62
	Hauraki	430	113,604	42,331	264	98	2.79
	Matamata-Piako	1,047	295,049	92,555	282	88	3.22
	South Waikato	370	121,727	41,611	329	112	2.98
Bay of Plenty	Western Bay of Plenty	208	67,856	22,988	326	111	2.98
	Tauranga	13	4,257	1,490	327	115	2.86
	Kawerau/Whakatane	318	96,202	34,431	303	108	2.88
	Opotiki	79	23,246	8,490	294	107	2.78
Central Plateau	Taupo	126	84,135	33,100	668	263	2.71
	Rotorua	317	129,979	47,889	410	151	2.75
Western Uplands	Waitomo	56	23,758	8,980	424	160	2.71
	Ruapehu	21	8,245	3,410	393	162	2.46
East Coast	Gisborne	4	1,443	634	361	159	2.29
	Wairoa	8	2,450	1,015	306	127	2.55
Hawkes Bay	Napier/Hastings	27	16,322	5,287	605	196	2.85
	Central Hawkes Bay	37	20,588	7,665	556	207	2.72
Taranaki	New Plymouth	452	108,808	41,178	241	91	2.69
	Stratford	257	59,578	22,927	232	89	2.62
	South Taranaki	1,084	306,240	104,176	283	96	2.98
Wellington	Wanganui	21	7,363	2,819	351	134	2.67
	Rangitikei	85	31,000	10,540	365	124	2.9
	Manawatu	267	89,099	32,220	334	121	2.79
	Palmerston North City	39	13,936	5,301	357	136	2.66
	Horowhenua	121	42,869	15,830	354	131	2.73
	Kapiti Coast	19	5,290	2,092	278	110	2.56
	Upper Hutt City	4	646	343	162	86	1.87
Wairarapa	Tararua	312	95,348	35,336	306	113	2.72
	Masterton	18	7,656	2,636	425	146	2.91
	Carterton	58	20,013	7,647	345	132	2.68
	South Wairarapa	87	35,479	12,911	408	148	2.76
North Island		9,050	2,757,305	999,536	305	110	2.82

(Table 3.3 continued)

Region	District	Total herds	Total cows	Total effective hectares	Average herd size	Average effective hectares	Average cows per hectare
Nelson/Marlborough	Marlborough	59	16,186	5,692	274	96	2.79
	Kaikoura	27	9,392	3,494	348	129	2.74
	Tasman / Nelson City	162	55,509	20,744	343	128	2.78
West Coast	Buller	131	47,759	20,227	365	154	2.45
	Grey	86	36,921	16,056	429	187	2.35
	Westland	151	47,918	23,290	317	154	2.17
North Canterbury	Hurunui	54	38,602	12,767	715	236	3.08
	Waimakariri	72	38,573	12,107	536	168	3.04
	Christchurch City	7	4,586	1,278	655	183	3.56
	Banks Peninsula	11	2,216	1,033	201	94	2.02
	Selwyn	168	116,696	34,998	695	208	3.33
	Ashburton	233	186,479	54,899	800	236	3.42
South Canterbury	Timaru/MacKenzie	114	76,096	23,719	668	208	3.28
	Waimate	70	54,677	17,471	781	250	3.16
Otago	Waitaki/Central Otago	108	70,738	23,235	655	215	3.17
	Dunedin City	67	22,638	8,422	338	126	2.73
	Clutha	156	77,253	27,508	495	176	2.82
Southland	Gore	107	53,300	19,725	498	184	2.7
	Invercargill	54	26,001	9,747	482	181	2.64
	Southland	549	274,022	100,601	499	183	2.74
South Island		2,386	1,255,562	437,013	526	183	2.86
New Zealand		11,436	4,012,867	1,436,549	351	126	2.83

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

Ashburton district has the highest average production per herd with 298,620 kilograms of milksolids (Table 3.4). Christchurch City has the highest average kilograms of milksolids per effective hectare (1,327). Hurunui district recorded the highest production per cow (414 kg of milksolids). The North Island district with the highest milksolids production per herd is Taupo with an average of 183,716 kilograms of milksolids.

Table 3.4: Herd production analysis by district in 2007/08

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 ha	Average kg protein per effective ha	Average kg milksolids per effective ha	Average kg milkfat per cow	Average kg protein per cow	Average kg milksolids per cow
Northland	Far North	949,587	45,217	34,366	79,583	349	265	614	162	123	285
	Whangarei	1,037,421	51,083	38,095	89,178	387	289	676	165	123	287
	Kaipara	964,818	45,981	34,953	80,934	362	274	637	164	124	288
Central Auckland	Rodney	827,163	40,447	30,442	70,889	370	279	648	158	119	278
	Manukau City	806,085	36,670	28,239	64,909	460	355	815	159	122	281
	Papakura	525,781	23,370	18,368	41,738	324	255	579	148	117	265
	Franklin	782,094	36,284	27,913	64,197	385	296	681	152	117	269
	Waikato	1,007,430	48,535	36,477	85,012	466	349	816	158	118	276
	Hamilton City	829,326	41,330	30,776	72,106	504	371	875	162	119	281
South Auckland	Waipa	1,092,463	53,651	40,080	93,732	520	387	907	164	123	287
	Otorahanga	1,072,129	52,899	39,448	92,347	481	358	839	164	122	286
	Thames-Coromandel	837,723	40,171	30,379	70,550	422	318	741	160	121	281
	Hauraki	894,981	43,531	32,727	76,258	462	347	809	165	124	289
	Matamata-Piako	962,045	47,958	35,506	83,465	538	398	936	167	124	291
	South Waikato	1,170,342	56,758	42,550	99,308	508	380	888	170	127	297

(Table 3.4 continued)

Region	District	Average litres per herd	Average kg milkfat per herd	Average kg protein per herd	Average kg milk solids per herd	Average kg milkfat per effective ha	Average kg protein per effective ha	Average kg milk solids per effective ha	Average kg milkfat per cow	Average kg protein per cow	Average kg milk solids per cow
Bay of Plenty	Western Bay of Plenty	1,128,451	55,475	41,267	96,742	506	376	882	169	126	294
	Tauranga	1,322,041	62,721	47,874	110,596	441	332	773	152	114	266
	Kawerau/Whakatane	1,169,834	55,538	42,014	97,551	532	402	935	184	139	323
	Opotiki	1,109,315	53,231	40,224	93,454	495	372	868	177	133	310
Central Plateau	Taupo	2,160,320	105,302	78,414	183,716	424	315	739	157	117	275
	Rotorua	1,423,940	68,314	51,162	119,476	468	350	817	170	127	298
Western Uplands	Waitomo	1,252,430	61,807	46,335	108,142	398	299	697	146	110	255
	Ruapehu	1,180,380	55,355	42,462	97,818	354	273	627	144	111	255
East Coast	Gisborne	1,127,876	47,371	39,250	86,621	260	215	475	112	93	205
	Wairoa	1,155,773	48,542	40,221	88,763	449	372	821	182	151	333
Hawkes Bay	Napier/Hastings	2,185,678	102,954	78,657	181,610	474	362	836	162	124	287
	Central Hawkes Bay	2,093,641	99,692	77,224	176,915	465	357	821	168	129	297
Taranaki	New Plymouth	813,396	42,103	30,901	73,004	465	341	806	172	127	299
	Stratford	806,724	41,269	30,762	72,030	464	345	809	176	131	308
	South Taranaki	930,847	48,869	35,888	84,758	514	376	890	172	126	297
Wellington	Wanganui	1,292,569	58,630	45,767	104,398	442	342	783	165	128	293
	Rangitikei	1,442,680	69,727	52,862	122,588	559	424	983	193	146	339
	Manawatu	1,262,796	60,511	46,335	106,846	498	381	879	177	135	312
	Palmerston North City	1,374,611	66,440	50,868	117,308	468	357	824	170	129	299
	Horowhenua	1,398,890	65,973	51,033	117,006	502	386	888	184	141	325
	Kapiti Coast	1,093,605	50,154	38,819	88,973	452	351	803	177	138	314
	Upper Hutt City	595,531	28,773	21,306	50,078	336	248	584	181	134	315
Wairarapa	Tararua	1,042,748	52,970	39,254	92,224	467	345	812	171	126	297
	Masterton	1,727,274	81,744	62,920	144,664	561	430	991	189	145	333
	Carterton	1,238,831	60,248	45,618	105,866	457	344	801	170	128	298
	South Wairarapa	1,536,779	74,895	57,370	132,265	503	384	888	181	138	319
North Island		1,050,728	51,670	38,696	90,366	475	355	830	168	125	293
Nelson/Marlborough	Marlborough	1,038,837	51,833	38,852	90,685	533	399	932	189	142	331
	Kaikoura	1,365,988	67,647	50,587	118,234	528	398	926	191	144	336
	Tasman/Nelson City	1,216,179	61,692	45,721	107,414	512	379	892	183	136	319
West Coast	Buller	1,207,137	61,643	45,912	107,554	428	316	743	174	129	303
	Grey	1,557,627	78,822	59,231	138,053	429	321	750	184	138	322
	Westland	1,151,671	60,845	44,596	105,441	417	306	722	194	142	335
North Canterbury	Hurunui	3,468,281	163,519	129,732	293,251	711	563	1,274	231	183	414
	Waimakariri	2,426,056	113,434	89,160	202,593	650	511	1,161	214	169	383
	Christchurch City	2,869,809	138,236	107,129	245,365	750	578	1,327	211	163	374
	Banks Peninsula	728,978	33,679	26,159	59,838	345	269	613	173	134	307
	Selwyn	3,013,796	145,440	112,552	257,992	712	551	1,263	215	167	382
	Ashburton	3,447,956	167,753	130,866	298,620	737	574	1,310	214	167	381
South Canterbury	Timaru/MacKenzie	2,992,722	142,325	111,924	254,249	712	557	1,268	216	169	385
	Waimate	3,225,842	157,894	121,828	279,721	645	498	1,143	204	157	361
Otago	Waitaki/Central Otago	2,764,651	132,700	103,201	235,900	671	521	1,192	211	164	376
	Dunedin City	1,488,883	69,628	54,656	124,285	571	449	1,020	213	168	380
	Clutha	2,072,826	98,489	77,256	175,745	567	445	1,013	200	157	358
Southland	Gore	2,085,661	99,766	78,145	177,912	547	428	974	203	159	363
	Invercargill	2,065,049	100,535	78,435	178,970	557	435	992	212	166	378
	Southland	2,097,398	102,253	79,774	182,027	568	443	1,011	209	163	372
South Island		2,194,374	106,729	82,695	189,424	585	452	1,037	204	157	361
New Zealand		1,289,337	63,158	47,876	111,033	498	375	873	175	132	307

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

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 had the choice of two herd testing service providers in 2007/08 (AmBreed and LIC) and were able to choose the frequency of testing. Data used in the following analysis includes figures from both herd test providers.

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

The regions in Chapter 4 refer to areas used by LIC. Appendix 1 shows a list of districts included in each region.

- 74% of herds undertake herd testing in 2007/08

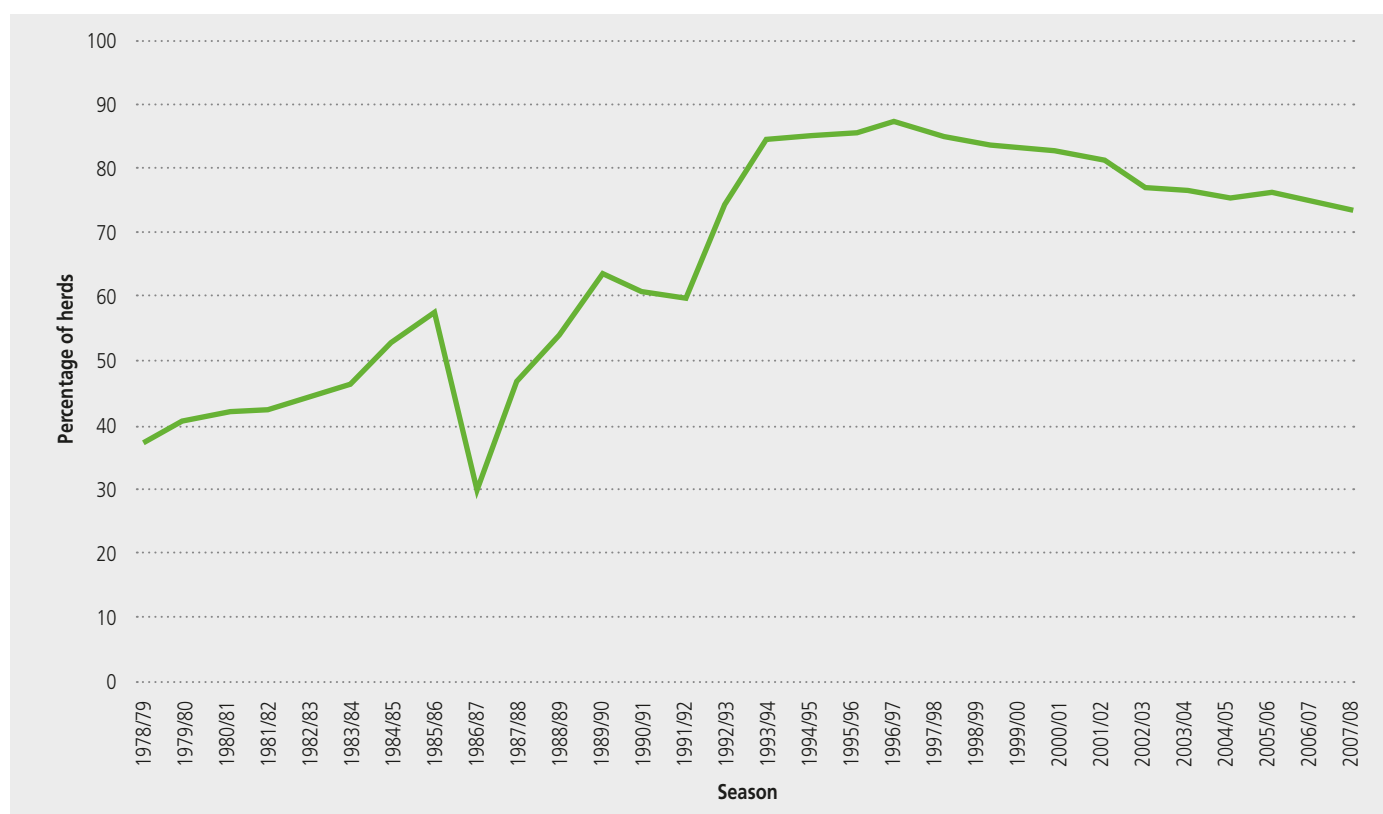
The percentage of total herds using herd testing decreased to 73.5% in 2007/08 (Table 4.1). This figure is down 13.7% from the highest percentage of herd testing set in 1996/97. However, the percentage of total cows tested increased slightly to 71.5%.

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

Season	Number of herds	% of total herds	Number of cows (000)	% of total cows	Total herds	Total cows
1988/89	7,932	53.8	1,341	59.1	14,744	2,269,073
1989/90	9,213	63.1	1,604	69.3	14,595	2,313,822
1990/91	8,918	60.7	1,566	65.2	14,685	2,402,145
1991/92	8,661	59.9	1,611	66.1	14,452	2,438,641
1992/93	10,843	75.0	2,039	78.3	14,458	2,603,049
1993/94	12,372	84.8	2,377	86.9	14,597	2,736,452
1994/95	12,446	85.0	2,474	87.4	14,649	2,830,977
1995/96	12,620	85.6	2,592	88.3	14,736	2,935,759
1996/97	12,851	87.2	2,746	89.6	14,741	3,064,523
1997/98	12,510	85.3	2,826	87.7	14,673	3,222,591
1998/99	12,059	84.0	2,819	85.7	14,362	3,289,319
1999/00	11,521	83.1	2,806	85.8	13,861	3,269,362
2000/01	11,472	82.6	2,942	84.4	13,892	3,485,883
2001/02	11,113	81.4	2,974	80.5	13,649	3,692,703
2002/03	10,113	77.0	2,855	76.3	13,140	3,740,637
2003/04	9,772	76.6	2,842	73.8	12,751	3,851,302
2004/05	9,306	75.8	2,811	72.7	12,271	3,867,659
2005/06	9,082	76.4	2,846	74.3	11,883	3,832,145
2006/07	8,692	74.7	2,791	71.2	11,630	3,916,812
2007/08	8,405	73.5	2,871	71.5	11,436	4,012,867

The trend in the percentage of total herds using herd testing continues to decrease from the peak reached in the 1996/97 season (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 2007/08 is shown in Table 4.2, where the number of cows tested refers to all cows tested at least once in the season. Taranaki had the highest percentage of herds using herd testing (80.8%) and also reported the highest percentage of cows herd testing (81%).

Table 4.2: Use of herd testing by LIC region in 2007/08

LIC Region	Herds tested	Total herds	% of total herds	Cows tested	Total cows	% of total cows	Average herd size tested	Average herd size
Northland	752	1,094	68.7	216,670	305,511	70.9	288	279
Auckland	3,275	4,421	74.1	1,005,912	1,389,732	72.4	307	314
Bay of Plenty/East Coast	468	631	74.2	139,477	194,561	71.7	298	308
Taranaki	1,453	1,798	80.8	385,165	475,742	81.0	265	265
Wellington/Hawkes Bay	795	1,100	72.3	279,400	389,561	71.7	351	354
South Island	1,662	2,392	69.5	844,483	1,257,760	67.1	508	526
New Zealand	8,405	11,436	73.5	2,871,107	4,012,867	71.5	342	351

Note: Table includes figures from both herd test providers

B. Herd test averages

The lactation yield figures in this section are for cows herd tested. Season 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 one hundred days or more were included in herd test averages. In comparison, the average milksolids figures given in Chapters 2 and 3 (national and regional dairy statistics respectively) are based on all herds supplying a dairy company, regardless of whether herd testing was used, and represent the average production per cow as supplied to the dairy company. Therefore, production figures reported using each of these methods will differ.

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 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 days-in-milk (herd testing).

i) Season averages

- *South Island has the highest herd test production (kg)*
- *Taranaki has the highest milkfat, protein and milksolids percentages*

Average per cow statistics for each LIC region is summarised in Table 4.3. The days-in-milk figure derived from tanker pick-up dates (production) more accurately reflects the lactation length than does the days-in-milk figure derived from herd tests and calving dates (herd testing).

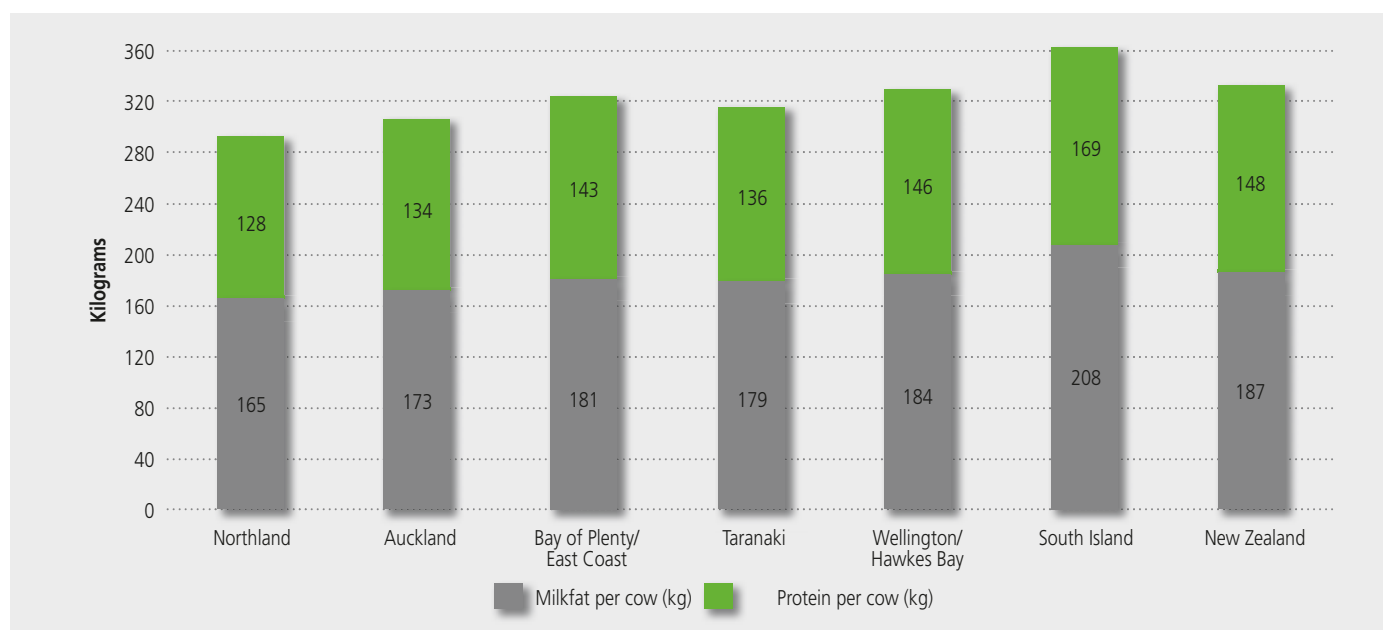
The South Island recorded the highest per cow milk volume (4,517 litres), milkfat (208 kg) and protein (169 kg) of cows herd tested. Taranaki recorded the highest percentages for milkfat (5.07%), protein (3.86%) and milksolids (8.93%).

Table 4.3: Season herd test averages per cow by LIC region in 2007/08

LIC 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	3,568	165	4.62	128	3.60	293	8.22	228	271	250
Auckland	3,691	173	4.69	134	3.63	307	8.32	217	240	241
Bay of Plenty / East Coast	3,982	181	4.55	143	3.58	324	8.14	227	260	263
Taranaki	3,535	179	5.07	136	3.86	316	8.93	221	250	258
Wellington / Hawkes Bay	3,990	184	4.62	146	3.65	330	8.27	221	263	261
South Island	4,517	208	4.61	169	3.75	377	8.35	232	266	265
New Zealand	3,987	187	4.68	148	3.70	334	8.38	225	252	246

The 2007/08 milkfat and protein lactation regional averages of herd tested cows (Graph 4.2) show some variability in figures between all regions, with milkfat production ranging from 165 (Northland) to 208 kg per cow (South Island) and protein production from 128 (Northland) to 169 kg per cow (South Island).

Graph 4.2: Average milkfat and protein production per cow in 2007/08



• **Decrease in production per cow (kg) for 2007/08**

The last twenty years have seen a general trend of increasing production in both milk volume and milksolids. However, in individual years this trend can be masked by other factors, in particular, weather conditions. The 1998/99 season recorded 260kg milksolids per cow, the lowest in more than 10 years (table 4.4).

The sharp decrease in the average somatic cell count per millilitre of milk from 1993/94 onwards compared with the seasons prior to 1993/94, as shown in Table 4.4, is due to a number of factors, including industry pressure for improved milk quality and farm management practice. However, a steady trend upwards has appeared over the last several seasons.

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)
1988/89	3,197	149	4.67	115	3.60	264	8.26	237	-	265
1989/90	3,221	152	4.72	117	3.66	269	8.35	235	-	358
1990/91	3,190	152	4.81	116	3.65	268	8.40	222	-	298
1991/92	3,361	162	4.83	124	3.70	286	8.51	226	-	282
1992/93	3,298	157	4.77	121	3.65	278	8.43	221	-	280
1993/94	3,560	171	4.84	131	3.69	302	8.48	223	-	216
1994/95	3,253	154	4.77	118	3.64	272	8.36	208	-	206
1995/96	3,501	164	4.72	126	3.60	290	8.28	224	-	206
1996/97	3,641	173	4.78	133	3.66	306	8.40	223	-	197
1997/98	3,373	158	4.67	119	3.52	277	8.21	209	266	195
1998/99	3,189	147	4.51	113	3.44	260	8.15	208	266	200
1999/00	3,601	169	4.69	130	3.58	299	8.30	221	263	193
2000/01	3,706	173	4.68	134	3.59	307	8.28	224	268	196
2001/02	3,791	176	4.64	138	3.61	314	8.28	227	268 ^a	210
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

- Not available

^a Average excludes Northland, Taranaki and Wellington/Hawkes Bay

ii) Monthly averages

• Highest average production per cow per day occurred in 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 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 illustrated by differing months of peak production.

Before September 1998, monthly herd test averages included all herds scheduled for four or more tests during the season. After this time all cows herd tested in each month were included, provided they were tested once or more during the season (Table 4.5).

Table 4.5: Monthly herd test averages by LIC region in 2007/08

Average litres of milk per cow per day

LIC Region	2007 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2008 Jan	Feb	Mar	Apr	May	Season average
Northland	15.80	14.26	17.59	18.56	18.25	16.63	15.42	13.88	11.60	10.52	9.30	11.15	14.59
Auckland	17.26	16.73	18.98	20.71	20.42	18.88	17.30	13.82	10.48	9.80	9.82	14.61	16.03
BOP / East Coast	10.13	12.46	20.43	21.79	21.65	19.30	17.48	14.79	13.65	11.69	9.58	11.33	16.48
Taranaki	14.29	14.62	17.21	19.60	19.43	17.98	15.96	14.37	11.57	10.02	8.58	10.28	15.12
Wgtn / Hawkes Bay	15.16	15.52	19.18	20.71	21.24	19.94	17.80	15.45	13.34	11.56	10.82	13.17	16.46
South Island	17.10	17.69	18.44	22.70	23.39	22.54	20.44	18.08	16.28	14.67	12.95	12.11	18.25
New Zealand	16.01	15.89	18.71	20.79	21.21	19.66	18.09	15.26	13.07	11.57	11.37	12.39	16.56

Average kg of milkfat per cow per day

LIC Region	2007 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2008 Jan	Feb	Mar	Apr	May	Season average
Northland	0.74	0.69	0.81	0.84	0.83	0.78	0.70	0.66	0.57	0.55	0.51	0.61	0.69
Auckland	0.80	0.79	0.89	0.94	0.93	0.89	0.81	0.67	0.54	0.55	0.57	0.79	0.77
BOP / East Coast	0.48	0.58	0.92	0.98	0.97	0.87	0.79	0.70	0.66	0.62	0.53	0.55	0.77
Taranaki	0.75	0.79	0.84	0.94	0.95	0.92	0.82	0.77	0.64	0.60	0.55	0.63	0.79
Wgtn / Hawkes Bay	0.74	0.71	0.87	0.92	0.95	0.92	0.82	0.75	0.66	0.63	0.60	0.72	0.79
South Island	0.82	0.83	0.86	0.99	1.04	1.03	0.95	0.85	0.80	0.76	0.71	0.68	0.87
New Zealand	0.76	0.75	0.87	0.94	0.97	0.93	0.85	0.74	0.66	0.64	0.64	0.69	0.80

Average kg of protein per cow per day

LIC Region	2007 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2008 Jan	Feb	Mar	Apr	May	Season average
Northland	0.57	0.51	0.64	0.66	0.66	0.61	0.56	0.51	0.43	0.41	0.38	0.46	0.54
Auckland	0.63	0.61	0.68	0.75	0.74	0.70	0.63	0.50	0.39	0.40	0.42	0.60	0.59
BOP / East Coast	0.39	0.45	0.74	0.78	0.78	0.70	0.62	0.53	0.49	0.46	0.40	0.48	0.60
Taranaki	0.57	0.57	0.63	0.74	0.74	0.71	0.63	0.57	0.46	0.42	0.39	0.46	0.60
Wgtn / Hawkes Bay	0.58	0.55	0.69	0.75	0.77	0.74	0.65	0.57	0.49	0.46	0.45	0.55	0.61
South Island	0.64	0.64	0.66	0.82	0.86	0.84	0.76	0.68	0.62	0.60	0.56	0.54	0.70
New Zealand	0.59	0.58	0.68	0.75	0.78	0.74	0.67	0.57	0.49	0.47	0.49	0.54	0.63

Average somatic cell count (000 cells per millilitre)

LIC Region	2007 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2008 Jan	Feb	Mar	Apr	May	Season average
Northland	255	269	222	210	209	211	243	247	280	290	328	337	250
Auckland	257	268	227	187	188	178	195	225	298	327	340	351	241
BOP / East Coast	322	380	263	218	208	194	217	230	260	284	317	436	263
Taranaki	371	292	345	193	192	188	198	214	264	292	331	336	258
Wgtn / Hawkes Bay	285	266	266	229	216	223	226	264	285	303	322	326	261
South Island	291	315	357	243	218	224	235	246	258	269	272	300	265
New Zealand	273	283	249	206	203	199	215	234	276	297	300	313	246

iii) Breed averages

- *Holstein-Friesian cows show highest milksolids (kg) production*

Herd test statistics by breed (Table 4.6) include cows herd tested four or more times during the season.

On average, Holstein-Friesian/Jersey crossbreed cows produced more milkfat than the other breeds listed, while Holstein-Friesian cows produced more protein and a higher volume of milk. Jerseys have the highest milkfat and protein percentages. In the Holstein-Friesian breed, six-year-old cows produced more milksolids than any other age group. Five and six-year-olds dominated production for Jerseys and Ayrshires, while six-year-olds had the highest production for Holstein-Friesian/Jersey crossbreeds.

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 breed averages by age of cow in 2007/08

Holstein-Friesian

Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	182,886	216	3,369	145.4	119.9	265.3	4.36	3.57	7.93
3	149,395	212	3,902	167.5	139.9	307.4	4.33	3.59	7.92
4	127,958	212	4,267	183.0	152.5	335.6	4.33	3.58	7.91
5	122,628	212	4,363	189.7	155.5	345.2	4.39	3.58	7.97
6	113,966	211	4,402	192.8	156.8	349.6	4.42	3.57	7.99
7	85,641	210	4,424	188.8	155.8	344.6	4.31	3.54	7.85
8	58,599	209	4,309	182.0	150.9	332.9	4.26	3.51	7.77
9	41,566	205	4,131	174.5	143.8	318.3	4.25	3.49	7.74
10+	65,714	201	3,790	162.9	131.7	294.6	4.33	3.48	7.81
Total	948,353	211	4,043	174.1	143.5	317.6	4.35	3.56	7.91

Jersey

Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	66,864	214	2,421	135.9	97.3	233.2	5.64	4.03	9.67
3	54,768	210	2,780	155.7	113.3	268.9	5.62	4.08	9.70
4	51,354	210	2,975	168.8	122.9	291.7	5.70	4.14	9.84
5	47,135	211	3,047	173.6	125.6	299.2	5.72	4.13	9.85
6	40,746	210	3,040	173.3	125.0	298.3	5.72	4.12	9.84
7	32,545	208	3,030	169.8	123.3	293.1	5.63	4.08	9.71
8	23,051	207	2,945	164.9	120.1	285.0	5.61	4.09	9.70
9	16,193	204	2,799	158.2	114.6	272.8	5.67	4.11	9.78
10+	21,329	199	2,679	147.9	108.3	256.2	5.53	4.05	9.58
Total	353,985	210	2,835	159.8	115.8	275.6	5.66	4.09	9.75

Holstein-Friesian/Jersey crossbreed

Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	171,274	214	3,019	147.3	114.0	261.3	4.93	3.79	8.72
3	138,168	211	3,522	170.8	134.1	304.9	4.90	3.82	8.72
4	122,745	212	3,816	185.7	146.1	331.8	4.92	3.85	8.77
5	109,401	212	3,928	193.3	150.1	343.4	4.97	3.84	8.81
6	91,344	212	3,949	195.3	150.6	346.0	4.99	3.83	8.82
7	67,582	211	3,930	191.6	148.6	340.2	4.92	3.80	8.72
8	45,938	209	3,778	184.6	143.0	327.6	4.92	3.80	8.72
9	30,917	206	3,624	177.7	137.0	314.7	4.94	3.80	8.74
10+	40,408	201	3,419	165.6	127.8	293.5	4.87	3.75	8.62
Total	817,777	211	3,610	176.4	137.2	313.5	4.93	3.81	8.74

Ayrshire

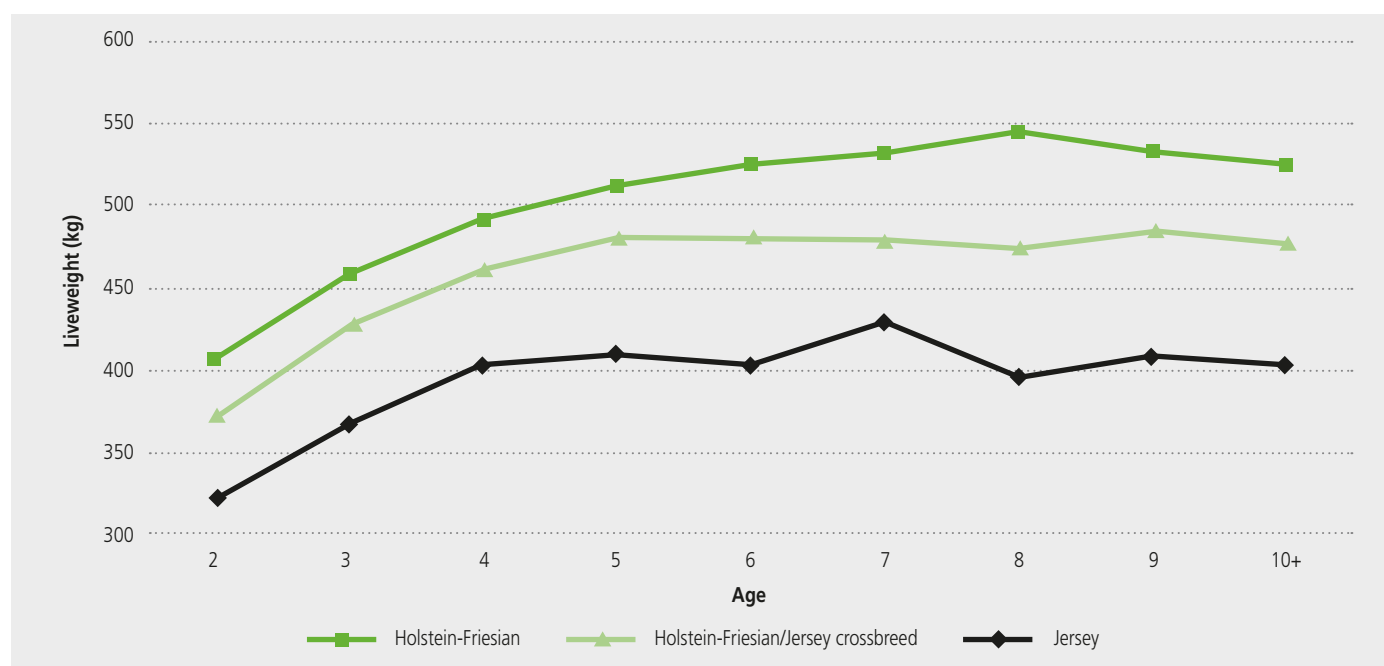
Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	4,017	217	2,904	128.5	102.5	231.0	4.44	3.53	7.97
3	3,271	213	3,336	146.0	119.4	265.4	4.38	3.58	7.96
4	2,809	215	3,664	160.0	131.5	291.5	4.38	3.59	7.97
5	2,709	216	3,849	166.7	137.9	304.6	4.34	3.59	7.93
6	2,441	215	3,880	166.6	138.9	305.5	4.31	3.58	7.89
7	1,844	214	3,859	165.7	137.5	303.2	4.31	3.57	7.88
8	1,439	211	3,783	162.2	134.4	296.6	4.29	3.55	7.84
9	1,079	210	3,710	158.8	131.5	290.3	4.29	3.55	7.84
10+	1,805	206	3,448	146.7	121.3	268.0	4.26	3.52	7.78
Total	21,414	214	3,528	153.0	125.7	278.7	4.35	3.56	7.91

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

Table 4.7: Liveweight by age and breed of cow in 2007/08

Age	Holstein-Friesian		Jersey		Holstein-Friesian/Jersey crossbred	
	Average liveweight (kg)	Number of cows	Average liveweight (kg)	Number of cows	Average liveweight (kg)	Number of cows
2	405	10,567	322	3,464	372	12,791
3	458	608	368	89	426	359
4	490	440	401	57	461	322
5	511	326	410	42	478	252
6	524	367	404	43	480	264
7	533	177	430	18	477	131
8	544	111	394	9	474	83
9	532	88	407	14	484	68
10+	525	122	402	26	476	80
Total	487		385		444	

Graph 4.3: Liveweight by age and breed of cow in 2007/08



C. Artificial Breeding (AB) statistics

- Over 3 million cows to AB for 2007/08

All artificial inseminations are recorded on the LIC National Database. Table 4.8 provides a summary of cows mated to AB for the last nine seasons. This is the sixth consecutive season where the percentage of cows to AB is below 80% (Graph 4.4). The number of yearlings to AB has increased to 169,007 in 2007/08 (Table 4.8).

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

Cows to AB

LIC Region	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Northland	246,617	257,752	261,197	228,988	218,488	212,210	205,352	197,676	199,971
Auckland	1,057,618	1,096,379	1,089,655	1,030,788	1,025,071	1,019,596	981,242	979,605	1,017,566
BOP / East Coast	152,751	157,162	154,762	147,047	145,464	140,493	139,975	140,961	144,633
Taranaki	405,605	427,683	423,723	400,322	398,794	388,277	380,160	370,379	387,908
Wellington / Hawkes Bay	276,517	294,387	302,349	291,188	281,448	279,240	286,348	281,315	290,832
South Island	587,957	660,075	756,874	769,954	817,952	829,141	854,850	888,964	976,202
New Zealand	2,727,065	2,893,438	2,988,560	2,868,287	2,887,217	2,868,957	2,847,927	2,858,900	3,017,112

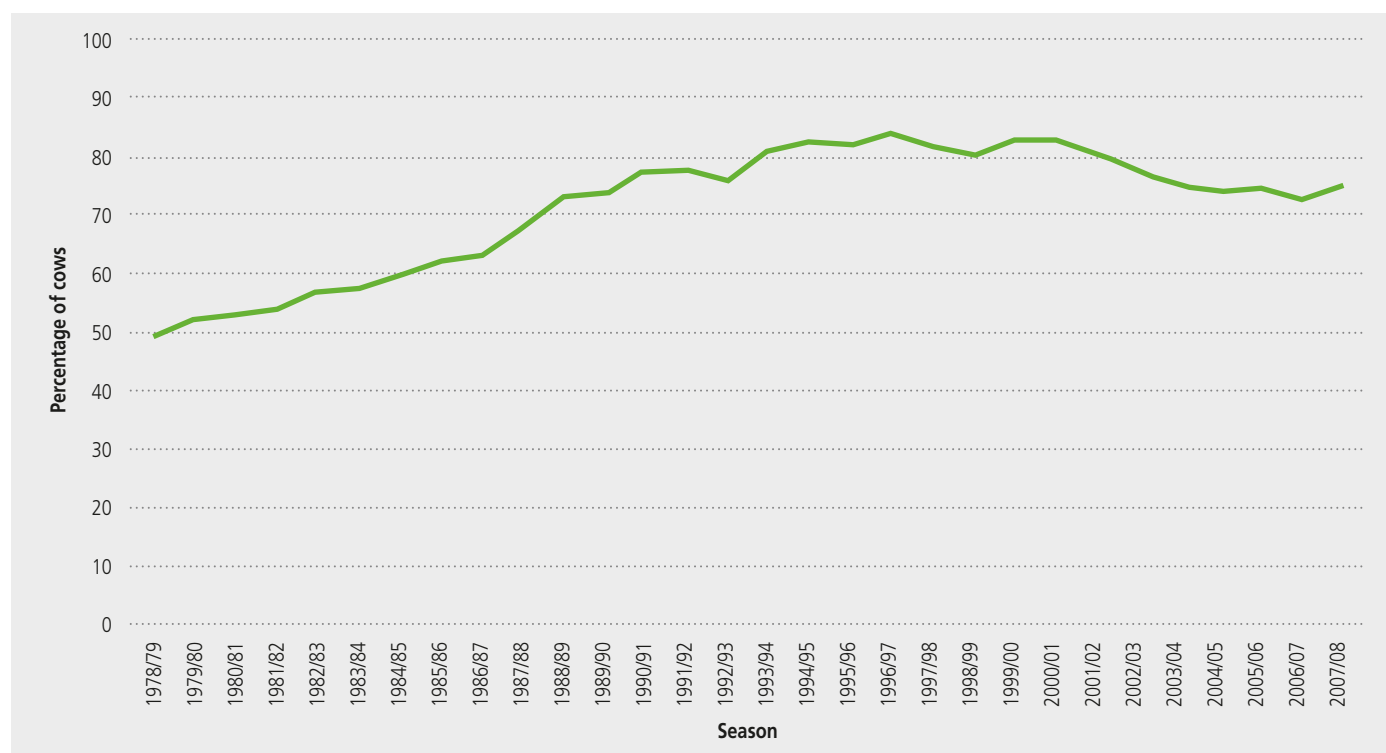
% Cows to AB

LIC Region	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Northland	69.5	76.4	74.4	66.3	64.3	64.2	66.0	64.2	65.5
Auckland	79.6	92.9	78.8	74.7	72.7	72.7	71.1	70.5	73.2
BOP / East Coast	81.6	85.2	81.8	77.9	74.8	73.2	73.5	73.1	74.3
Taranaki	81.8	88.7	84.6	82.7	80.5	78.5	78.8	77.0	81.5
Wellington / Hawkes Bay	74.2	81.5	79.3	76.1	72.6	72.8	76.7	72.1	74.7
South Island	78.7	91.2	85.2	80.3	79.8	78.0	78.1	76.8	77.6
New Zealand	78.2	88.5	80.9	76.7	75.0	74.2	74.3	73.0	75.2

Yearlings to AB

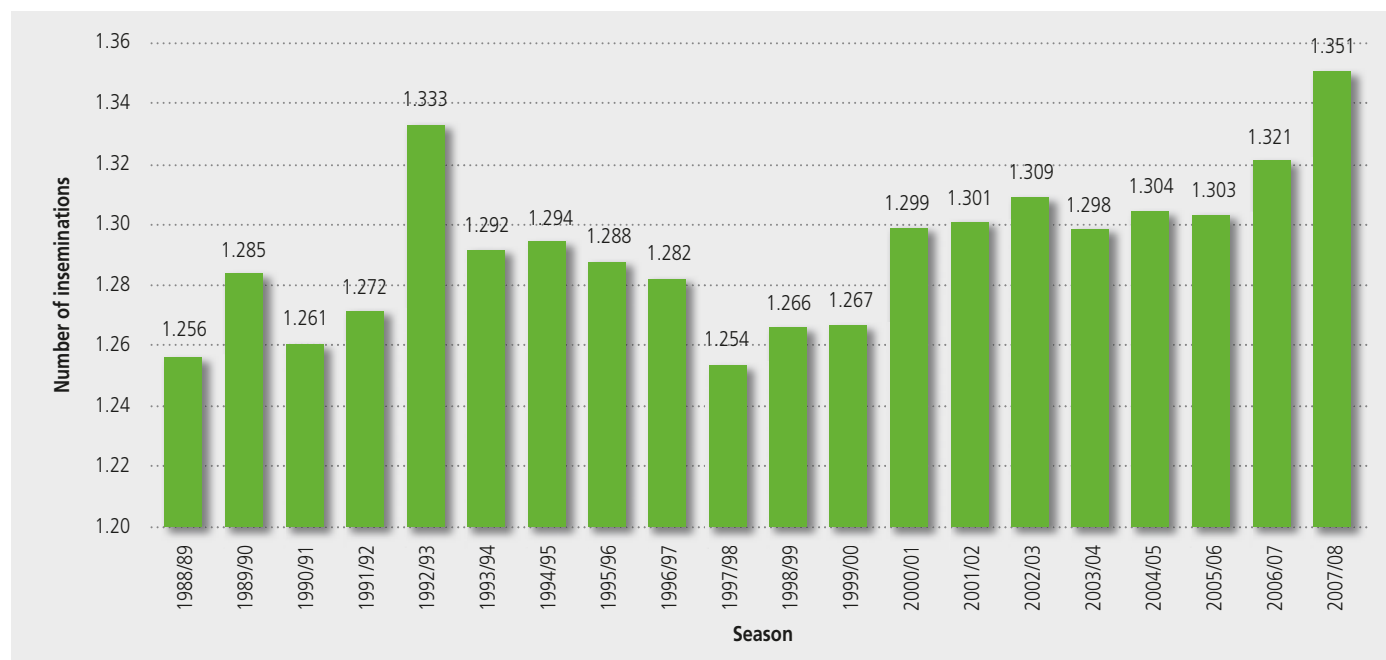
LIC Region	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Northland	9,825	10,437	10,942	7,982	7,765	7,428	8,490	9,334	13,516
Auckland	21,804	24,543	24,988	20,143	17,264	17,275	16,972	20,973	29,319
BOP / East Coast	7,250	8,492	8,929	6,763	4,691	5,014	6,645	7,579	11,398
Taranaki	5,700	7,698	7,528	8,220	3,703	3,268	3,373	3,408	8,227
Wellington / Hawkes Bay	6,313	7,823	7,517	5,948	5,076	5,960	7,330	7,613	12,833
South Island	41,469	56,743	55,680	47,162	39,401	40,019	52,985	61,100	93,714
New Zealand	92,361	115,736	115,584	96,218	77,900	78,964	95,795	110,007	169,007

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



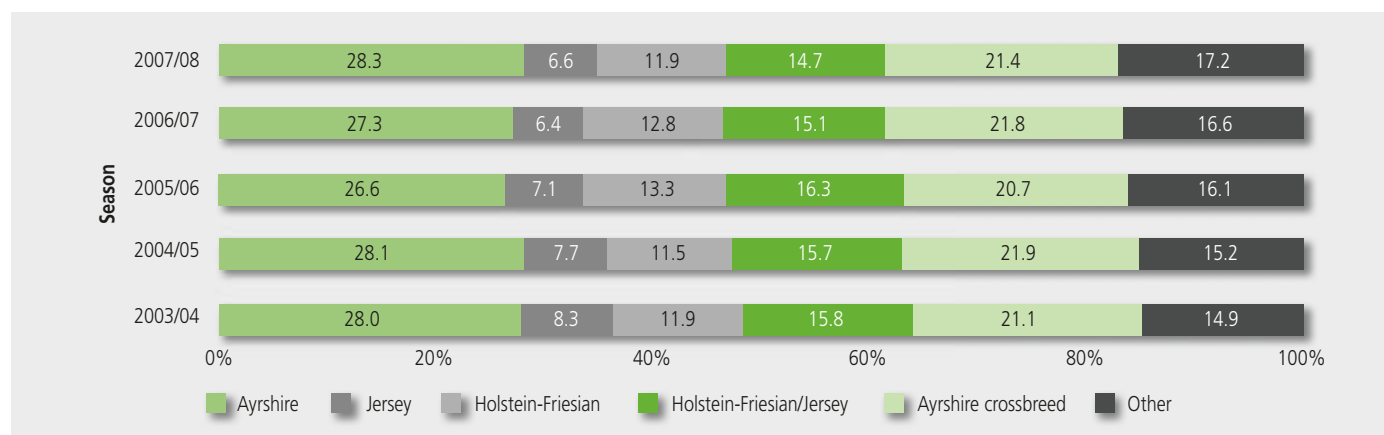
In 2007/08 the average number of inseminations per cow (1.35) as recorded on the LIC National Database was higher compared with the previous season (1.321) (Graph 4.5).

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

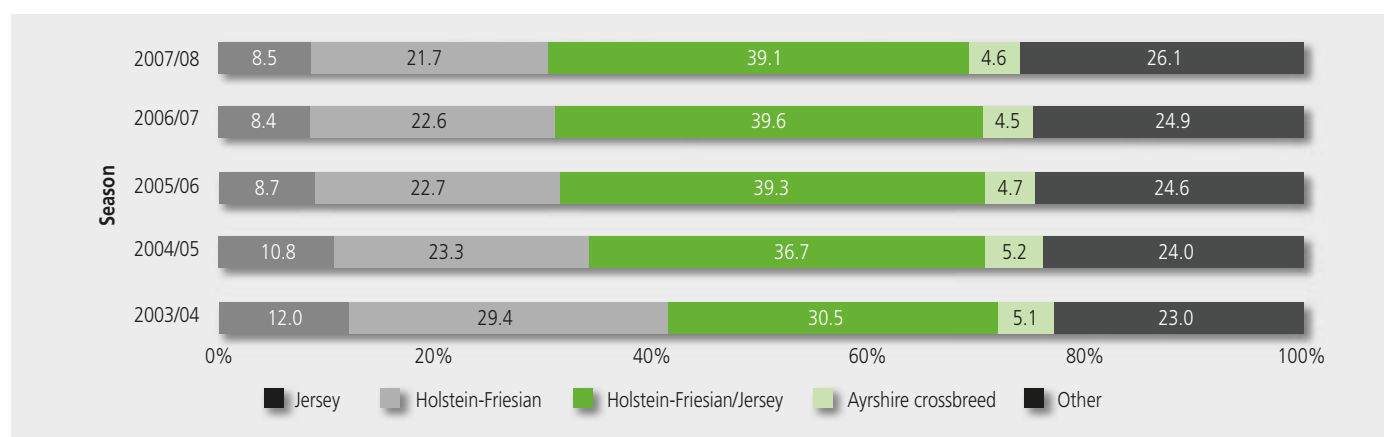


The use of Ayrshire, Holstein-Friesian and Jersey semen over different cow breeds for the past five seasons is shown in the graphs below. Ayrshire semen use over Ayrshire cows is 28.3% (Graph 4.6). Crossbreed semen is used predominantly over Friesian/Jersey crosses (Graph 4.7). The use of Jersey semen over other breeds remains similar to the previous season (Graph 4.8). The percentage of Holstein-Friesian semen over Holstein-Friesian cows continues to decrease, and has been increasing over Friesian/Jersey crosses (Graph 4.9).

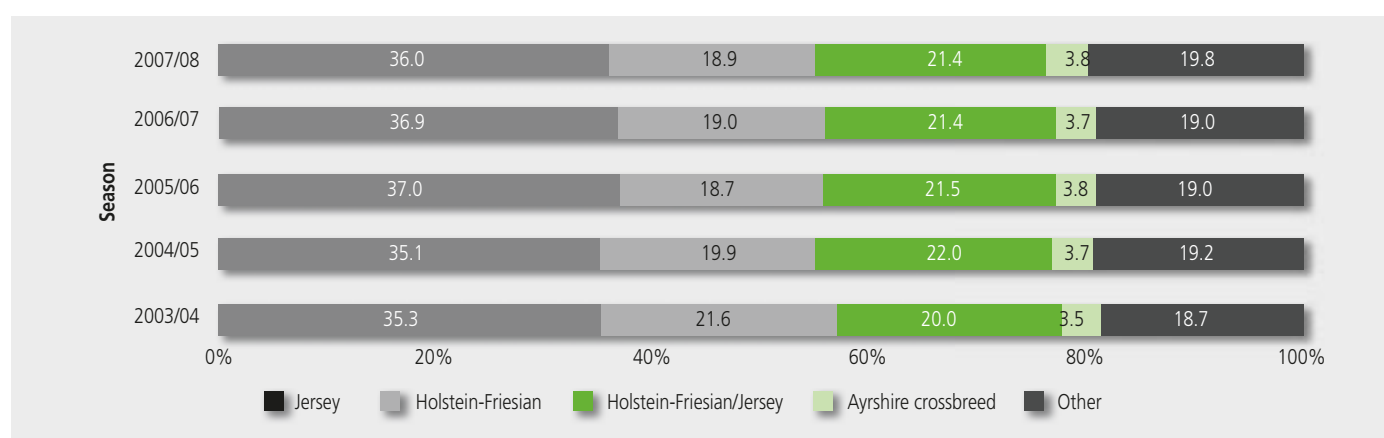
Graph 4.6: Ayrshire semen usage (%) over cow breed for the last five seasons



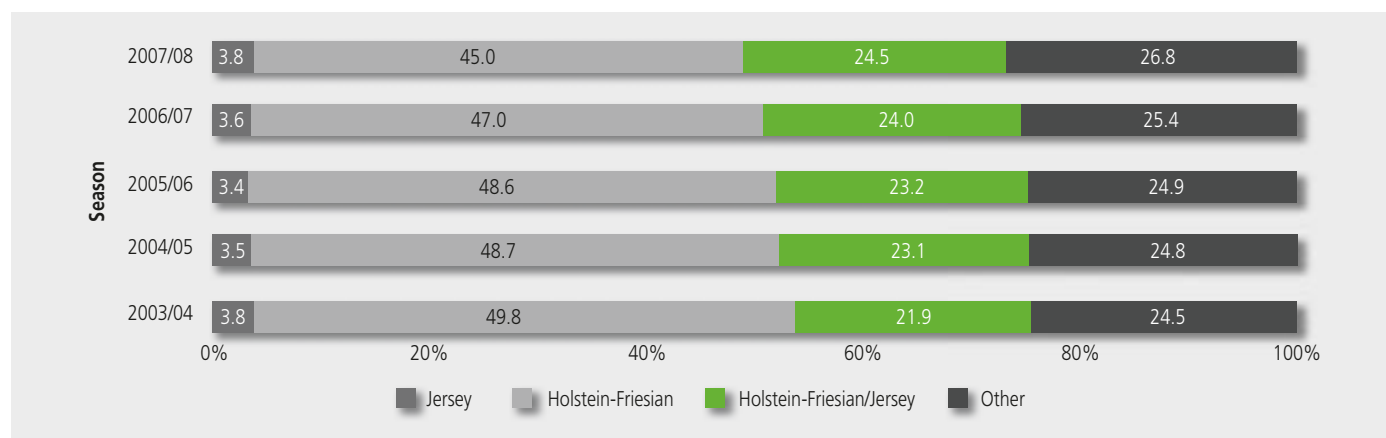
Graph 4.7: Crossbreed semen usage (%) over cow breed for the last five seasons



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

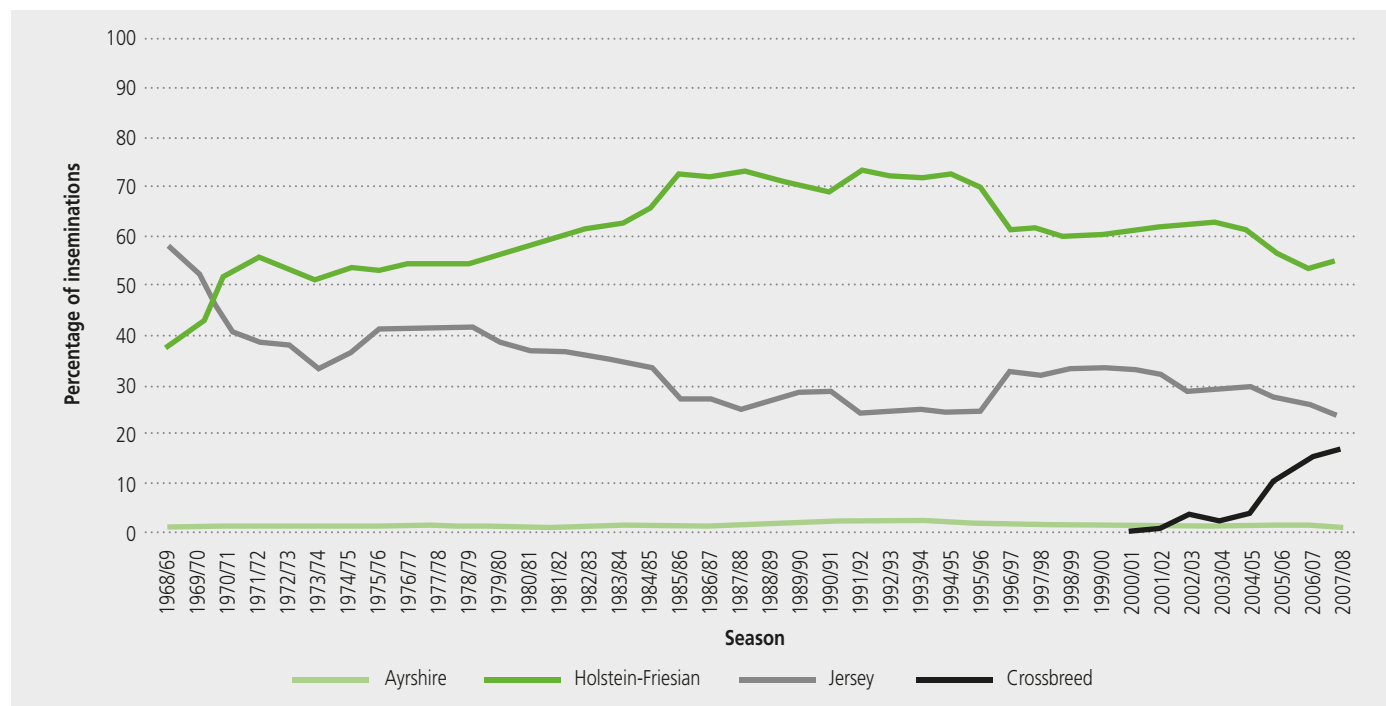


Graph 4.9: Holstein-Friesian semen usage (%) over cow breed for the last five seasons



The percentage of inseminations for each major breed (Holstein-Friesian, Jersey and Ayrshire) as recorded on the LIC National Database is shown in Graph 4.10. The percentage of inseminations for Holstein-Friesian increased slightly in use, while the Jersey breed continues to decline. The percentage of inseminations for crossbreed (shown for the last eight seasons) increased from 15.2% in 2006/07 to 17.4% for the 2007/08 season.

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



D. 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. 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 evaluation calculated for New Zealand dairy animals:

- 1. Trait evaluations** are estimates of an animal's genetic merit (Breeding Values) and lifetime productive ability (Production Values) for individual traits including milkfat, protein, volume, liveweight, somatic cell, fertility and residual survival.
- 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 4.5 tonnes of dry matter in average quality pasture.

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

$$\begin{aligned}
 \text{Breeding Worth} = & \text{Milkfat BV} \quad \times \quad \$\text{EV (Milkfat)} \quad + \\
 & \text{Protein BV} \quad \times \quad \$\text{EV (Protein)} \quad + \\
 & \text{Milk BV} \quad \times \quad \$\text{EV (Milk)} \quad + \\
 & \text{Liveweight BV} \quad \times \quad \$\text{EV (Liveweight)} \quad + \\
 & \text{Somatic Cell BV} \quad \times \quad \$\text{EV (Somatic cell)} \quad + \\
 & \text{Fertility BV} \quad \times \quad \$\text{EV (Fertility)} \quad + \\
 & \text{Residual Survival BV} \quad \times \quad \$\text{EV (Residual Survival)}
 \end{aligned}$$

where: BV = Breeding Value for each trait

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

Animal Evaluation ranks animals in terms of their expected profit per unit of feed eaten. Breeding Worth (BW) and Production Worth (PW) are based on future price predictions for milk components.

The economic values for 2008 are presented below (Table 4.9). The economic values are reviewed annually and therefore may change from year to year.

Table 4.9: Economic values used from 16 February 2008

	Milkfat (\$/kg)	Protein (\$/kg)	Milk (\$/kg)	Liveweight (\$/kg)	Somatic Cell (\$/score)	Fertility (\$/%)	Residual Survival (\$/day)
Breeding Worth	1.502	7.523	-0.084	-1.249	-29.118	2.628	0.040
Production Worth	1.410	6.425	-0.073	-1.088	-	-	-

The information for all Animal Evaluation statistics was sourced from cows and sires recorded on the LIC National Database as at 10 May 2008. The BW and PW figures have been taken from the evaluation released on 10 May 2008. This evaluation was conducted with reference to a genetic base of cows born in 1985. From July 2008 Animal Evaluation has been conducted with reference to a genetic base of cows born in 1995. Average BW and PW figures for evaluations conducted after 4 July 2008 are lower than the averages for the May 2008 evaluation, because all animals are compared with a genetically better group of cows than the 1985 group.

Table 4.10 shows the Breeding Values (BV) and Breeding Worth (BW) by breed of all bulls born in 2003 first proven in the 2007/08 season with a BW Reliability of 75% 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 thousands of performance recorded daughters or grand-daughters.

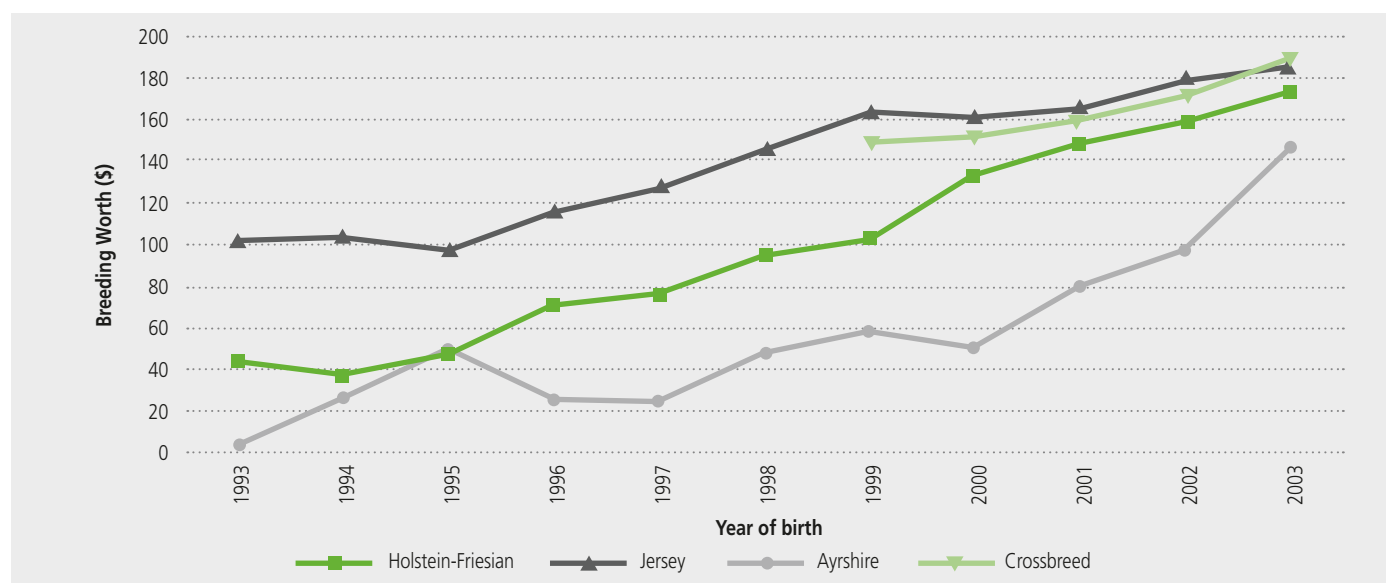
Table 4.10: Average Breeding Values and Breeding Worth of 2003 born bulls (reliability of 75% or greater)

Breed	Milkfat BV	Protein BV	Milk Volume BV	Liveweight BV	Somatic Cell BV	Fertility BV	Residual Survival BV	BW	Number of Bulls
Ayrshire	26.5	27.8	777.7	17.3	0.08	-5.7	68.7	147.7	7
Holstein- Friesian	38.0	44.5	1274.0	74.3	0.41	-2.3	-32.6	173.0	206
Jersey	24.7	14.4	14.4	-35.9	0.33	1.0	17.1	184.9	122
Holstein Friesian/Jersey crossbreeds	32.0	29.5	600.2	18.2	0.33	1.2	-29.5	189.4	66

(Evaluation date: 10 May 2008)

The genetic trend of proven dairy bulls is shown in Graph 4.11. Bulls born in 2003 are first proven in the 2007/08 season.

Graph 4.11: Genetic trend of proven dairy bulls by year of birth (reliability of 75% or greater)



(Evaluation date: 10 May 2008)

Young bulls are initially selected for use in Artificial Breeding based on the genetic merit of their sire and dam. 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 4.11 shows the number of sires, by birth year and breed, for which the Reliability of the BW was at least 75%. 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 4.11: Number of sires by birth year and breed (reliability of BW 75% or greater, includes overseas bulls)

Year of birth	Number of sires	Holstein-Friesian	Jersey	Holstein Friesian/ Jersey crossbreeds	Ayrshire	Other breeds
1993	410	242	122	0	37	9
1994	444	266	136	2	36	4
1995	489	300	139	0	41	9
1996	438	246	147	2	37	6
1997	436	269	130	3	29	5
1998	446	263	145	6	29	3
1999	403	212	131	23	34	3
2000	475	250	125	67	30	3
2001	473	228	147	70	24	4
2002	489	251	148	71	16	3
2003	401	206	122	66	7	0

(Evaluation date: 10 May 2008)

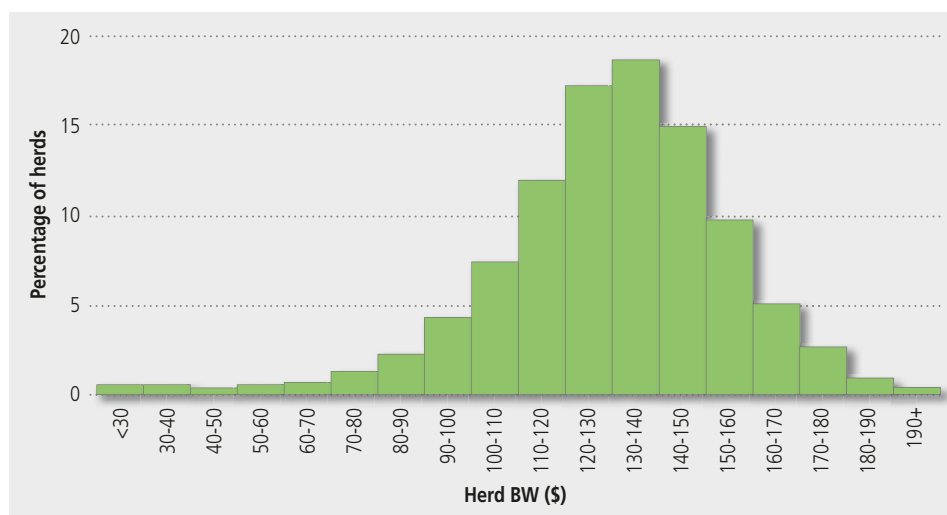
The Breeding Worth for **herds** presented below (Table 4.12 and Graph 4.12) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2007/08 season. Table 4.12 shows that 50% of these herds had a BW of 130 or above and 25% of these herds had a BW of 144 or above.

Table 4.12: Herd Breeding Worth in 2007/08

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Herd BW	130	> 166	> 158	> 144	< 113	< 96	< 82

(Evaluation date: 10 May 2008)

Graph 4.12: Distribution of Herd Breeding Worth in 2007/08



(Evaluation date: 10 May 2008)

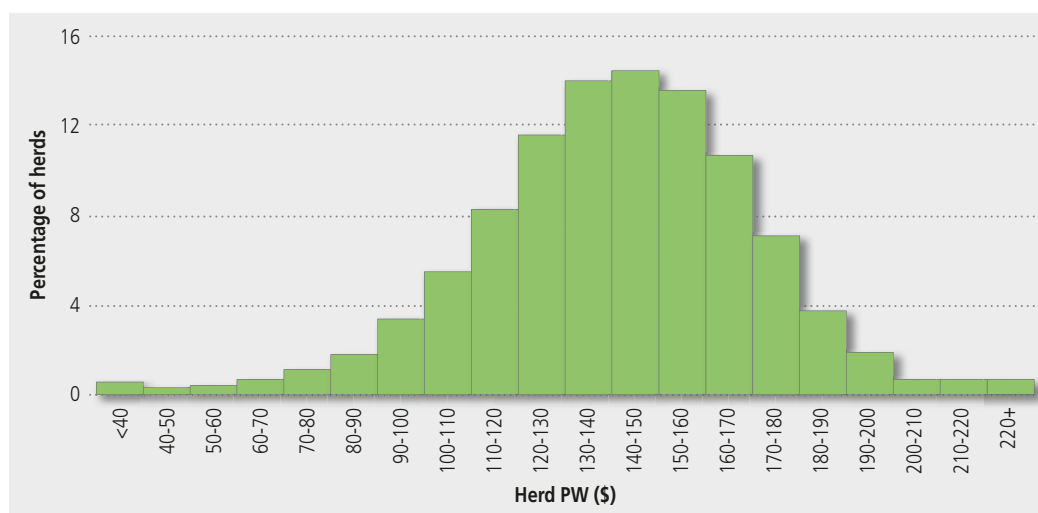
The Production Worth (PW) for **herds** presented below (Table 4.13 and Graph 4.13) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2007/08 season. Table 4.13 shows that 50% of these herds had a PW of 140 or above and 25% of these herds had a PW of 158 or above.

Table 4.13: Herd Production Worth in 2007/08

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Herd PW	140	> 183	> 174	> 158	< 120	< 101	< 88

(Evaluation date: 10 May 2008)

Graph 4.13: Distribution of Herd Production Worth in 2007/08



(Evaluation date: 10 May 2008)

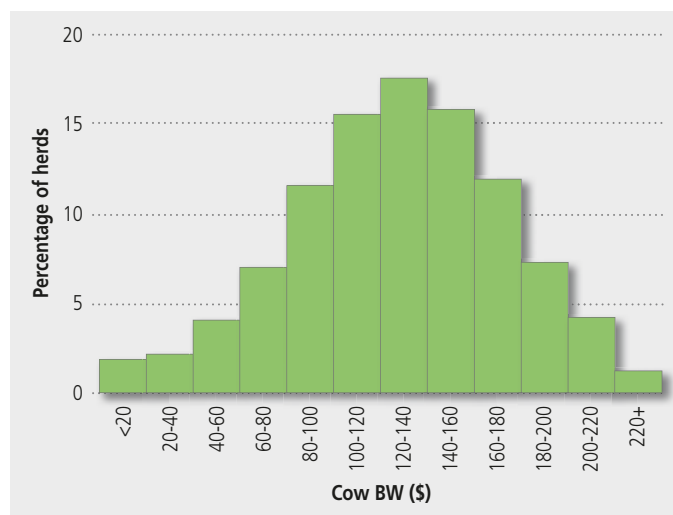
The Breeding Worth (BW) for **cows** presented below (Table 4.14 and Graph 4.14) is based on all cows of the users of herd testing services, in herds with at least 80 cows, and signed up for herd testing in the 2007/08 season. Table 4.14 shows that 50% of these cows had a BW of 129 or above and that 25% of these cows had a BW of 160 or above.

Table 4.14: Cow Breeding Worth in 2007/08

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Cow BW	129	> 202	> 186	> 160	< 98	< 67	< 46

(Evaluation date: 10 May 2008)

Graph 4.14: Distribution of Cow Breeding Worth in 2007/08



(Evaluation date: 10 May 2008)

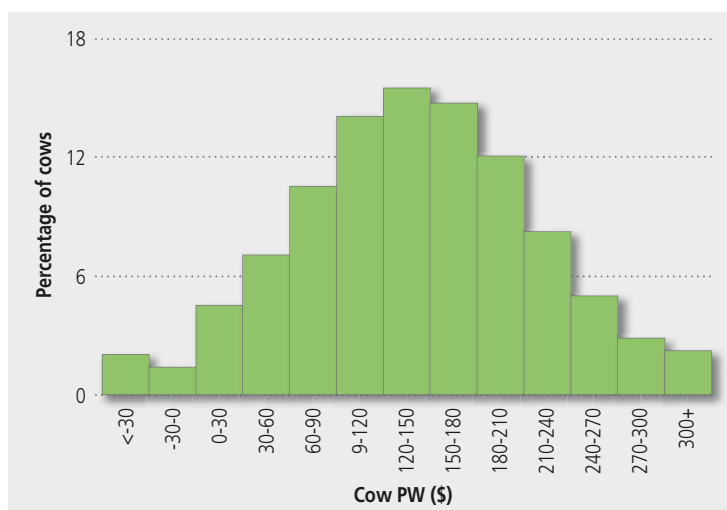
The Production Worth (PW) for **cows** presented below (Table 4.15 and Graph 4.15) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2007/08 season. Table 4.15 shows that 50% of these cows had a PW of 139 or above and that 25% of these cows had a PW of 192 or above.

Table 4.15: Cow Production Worth in 2007/08

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Cow PW	139	> 270	> 240	> 192	< 87	< 36	< 3

(Evaluation date: 10 May 2008)

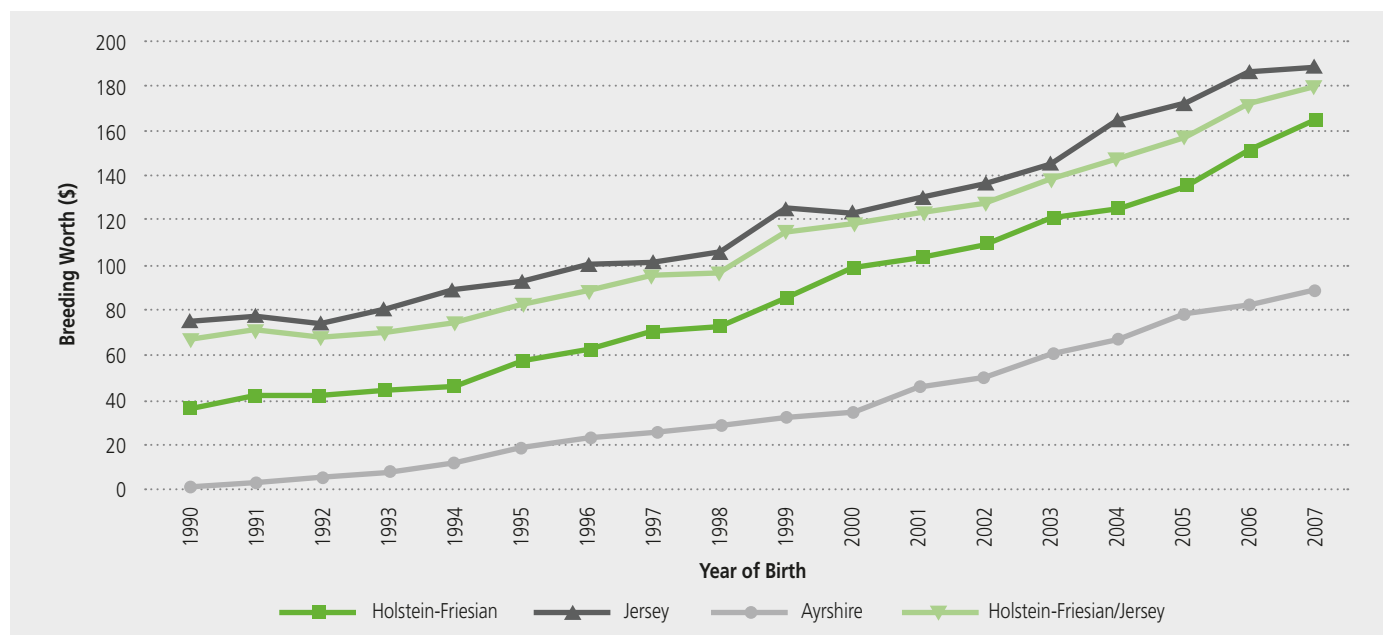
Graph 4.15: Distribution of Cow Production Worth in 2007/08



(Evaluation date: 10 May 2008)

The genetic trend for cows is based on all cows (alive or dead) recorded on the Livestock Improvement National Database in the 2007/08 season. Also included are the estimated BW and PW for replacement stock (2006 and 2007 born animals). All evaluations can be compared across breeds. The genetic trend for BW by breed is presented in Graph 4.16. The Breeding Worth for all breeds has increased over time.

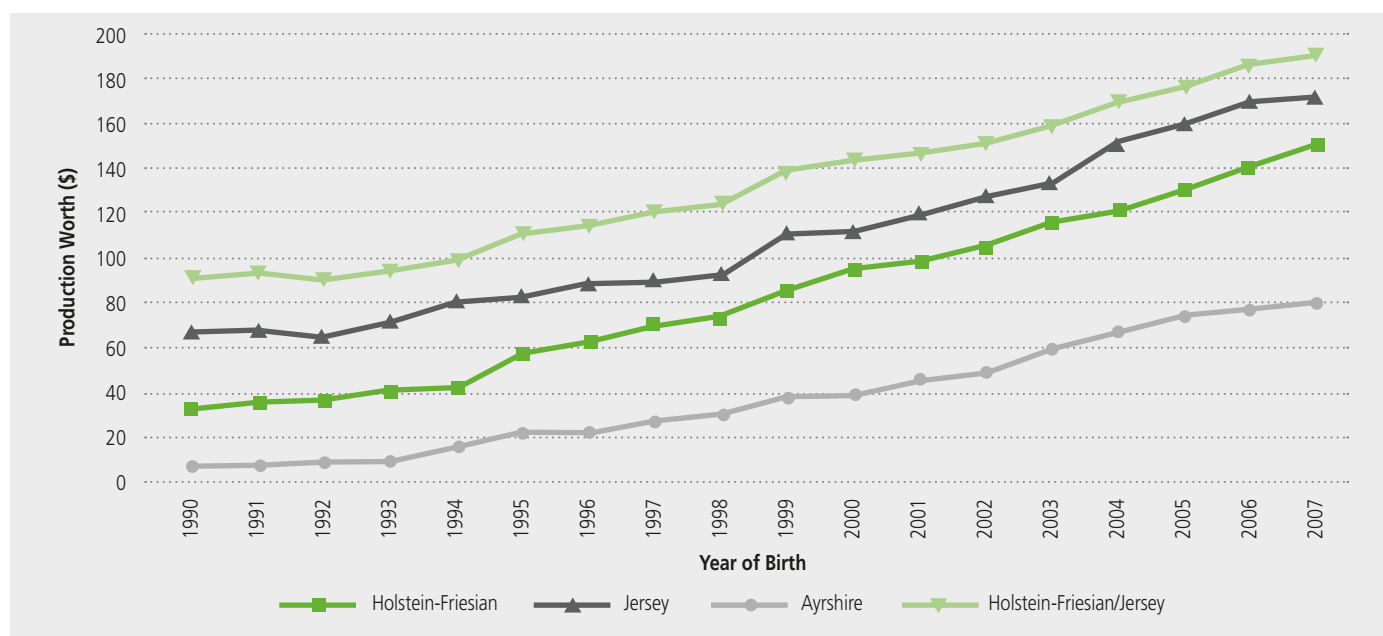
Graph 4.16: Trend in Breeding Worth for all cows



(Evaluation date: 10 May 2008)

The trend for PW by breed is presented in Graph 4.17. Holstein-Friesian/Jersey crossbreeds have maintained a higher PW over other breeds, caused by the effects of heterosis (hybrid vigour) in the crossbreeds.

Graph 4.17: Trend in Production Worth for all cows



(Evaluation date: 10 May 2008)

Table 4.16 shows the average BVs and BW by breed, of all 2005 born cows. The Jersey cows had the highest average BW at 172.1. The Holstein-Friesian cows had the highest milkfat, protein and milk volume BVs. All evaluations are comparable across breeds.

Table 4.16: Average Breeding Worth and Breeding Values of all cows by breed born in 2005.

Breed	BW \$	Milkfat BV (kg)	Protein BV (kg)	Milk volume BV (l)	Liveweight BV (kg)	Somatic Cell BV (score)	Fertility BV (%)	Residual Survival BV (days)	Cow numbers
Holstein-Friesian	135.3	32.1	34.7	1,012	60.3	0.34	-0.4	-58	402,230
Jersey	172.1	24.2	13.9	29	-31.8	0.24	1.0	-42	130,286
Ayrshire	77.3	12.6	18.4	528	22.7	-0.03	-5.5	151	8,130
Holstein-Friesian /Jersey	156.3	29.2	25.4	560	17.8	0.29	0.5	-51	271,455
Guernsey	-71.5	-5.2	2.4	33	35.0	0.53	-5.3	-170	108
Milking Shorthorn	-16.1	-3.8	7.5	202	31.8	0.19	-3.6	130	627
Brown Swiss	-53.5	-6.6	8.5	207	52.7	0.07	-11.4	185	93
Other	121.4	22.7	22.9	553	22.4	0.20	-1.6	3	40,003
Weighted average	146.2	29.3	27.8	691	30.5	-0.63	0.0	-48	852,932

(Evaluation date: 10 May 2008)

Survivability is measured by the percentage of cows that have a lactation recorded for consecutive years. The 2007/08 season 2-3 years figure is the percentage of cows that were milking as two-year-olds in the 2006/07 season and are now milking as three-year-olds in the 2007/08 season. Table 4.17 shows that for the 2007/08 season the highest percentage of survival is in animals ageing from 3-4 years (87.6%), followed by animals ageing from 4-5 years (87.2%).

Table 4.17: 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

5. General statistics

A. Prices received by dairy farmers

i) Milksolids

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 its 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 become separate co-operatives. Consequently, the historic payment system became redundant. Tatua and Westland have now 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 suppliers to town supply dairy companies varies between companies. Some town supply 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.

- **Average dairy company payout was \$7.67**

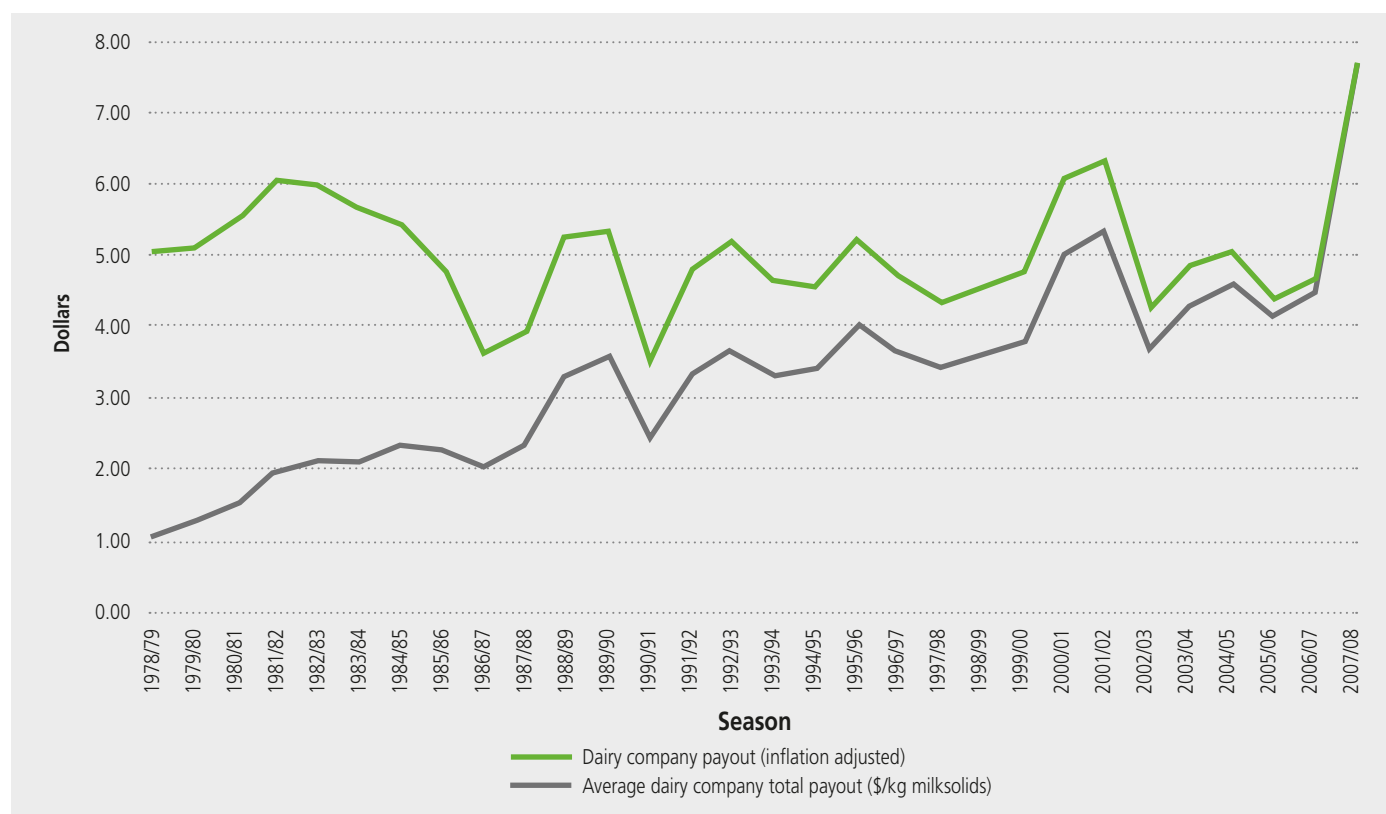
The average weighted dairy company total payout (per kilogram of milksolids) received by dairy farmers from seasonal supply dairy companies is shown in Table 5.1 (weightings are based on the number of herds supplying each dairy company). The average payout is given in both nominal and inflation adjusted dollars using the Consumers Price Index.

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

Season	Average weighted dairy company total payout (\$/kg milksolids)	Dairy company payout (inflation adjusted) ^a
1988/89	3.28	5.23
1989/90	3.59	5.32
1990/91	2.42	3.49
1991/92	3.34	4.78
1992/93	3.66	5.15
1993/94	3.32	4.62
1994/95	3.40	4.53
1995/96	3.99	5.21
1996/97	3.63	4.69
1997/98	3.42	4.34
1998/99	3.58	4.57
1999/00	3.78	4.72
2000/01	5.01	6.07
2001/02	5.35	6.31
2002/03	3.66	4.25
2003/04	4.25	4.82
2004/05	4.58	5.05
2005/06	4.10	4.35
2006/07	4.46	4.64
2007/08	7.67	7.67

^a 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 company retentions and deduction for DairyNZ Levy.
Note: Average dairy company total actual payout prior to 1989/90 has been derived from \$/kg milkfat

Graph 5.1: Trend in milksolids payout to dairy farmers for the last 30 seasons



ii) Dairy farm land sale values

- Average sale price of farms over \$2.5 million
- Substantial increase in nominal price per hectare

The average sale price of dairy farms (\$2.54 million) continues to increase compared with previous years (Table 5.2).

Table 5.2: Trend in dairy land sale values for the last 20 years

Year	Number of farms	Average sale price (\$)	Inflation adjusted average sale price ^a	Average hectares	Average price per hectare (\$)	Inflation adjusted average price per hectare ^a	Price per kg milkfat ^b	Price per kg milksolids ^c	Consumers Price Index
1988	576	278,650	446,190	56	5,013	8,027	16.0	9.2	637
1989	1,013	325,847	499,795	59	5,561	8,530	17.8	10.2	665
1990	868	373,553	532,157	58	6,467	9,213	21.8	12.5	716
1991	538	362,819	502,820	58	6,283	8,707	21.7	12.5	736
1992	897	446,979	613,619	62	7,183	9,861	23.1	13.3	743
1993	834	543,984	736,871	61	8,903	12,060	31.0	17.8	753
1994	784	704,245	943,929	61	11,640	15,602	37.5	21.6	761
1995	672	775,110	993,231	58	13,400	17,171	41.9	24.1	796
1996	784	785,510	986,724	60	13,187	16,565	41.6	23.9	812
1997	520	674,809	838,374	54	12,388	15,391	38.5	22.1	821
1998	496	704,309	860,354	64	11,076	13,530	32.0	18.4	835
1999	600	769,606	943,507	72	10,759	13,190	33.1	19.0	832
2000	576	856,374	1,028,859	80	10,740	12,903	35.3	20.3	849
2001	941	1,032,618	1,202,363	74	13,959	16,254	41.2	23.7	876
2002	704	1,049,939	1,189,931	72	14,658	16,612	45.6	26.2	900
2003	722	1,347,676	1,505,618	82	16,498	18,432	49.9	28.7	913
2004	800	1,550,792	1,691,773	85	18,287	19,949	50.1	28.8	935
2005	728	1,833,049	1,943,565	87	21,085	22,356	56.2	32.3	962
2006	576	2,208,693	2,252,867	87	25,308	25,814	65.4	37.6	1000
2007	699	2,541,870	2,541,870	91	28,035	28,035	73.6	42.3	1020

Source: Quotable Value New Zealand Rural Property Sales Statistics (Table D3)

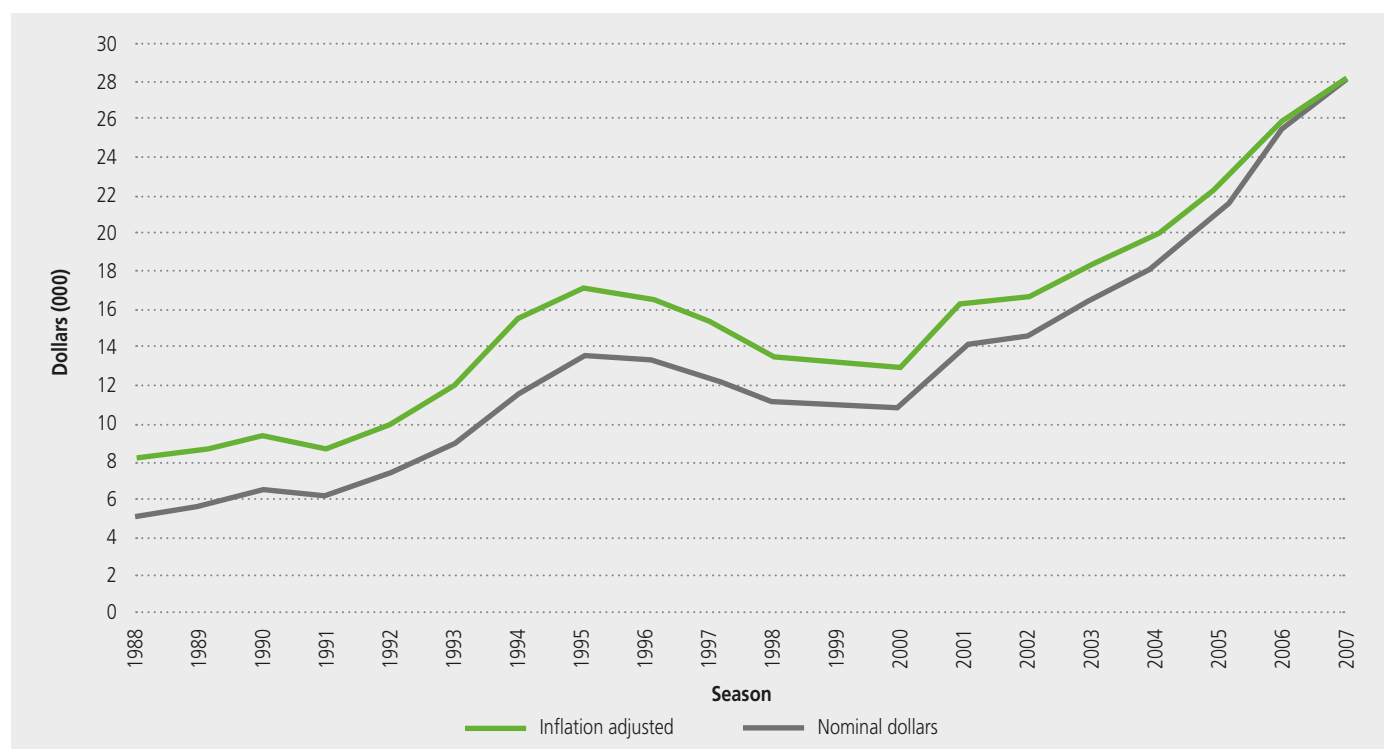
^a Adjusted using the Consumers Price Index for the end of the June quarter

^b Price per kg milkfat has been derived from price per kg milksolids (1996 to current year)

^c Price per kg milksolids has been derived from price per kg milkfat (1978 to 1995)

Prior to 1992 the average price per hectare fluctuated considerably, in both real and nominal terms, as shown in Graph 5.2. The average price per hectare rose steeply from 1992 to 1995. Between 1995 and 2000, the average price per hectare decreased. However, this trend reversed decisively in 2001 and the price per hectare is currently \$28,035. These figures are based on the calendar year (Jan-Dec), as opposed to the dairy industry season (Jun-May).

Graph 5.2: Trend in dairy land values (price per hectare) for the last 20 years



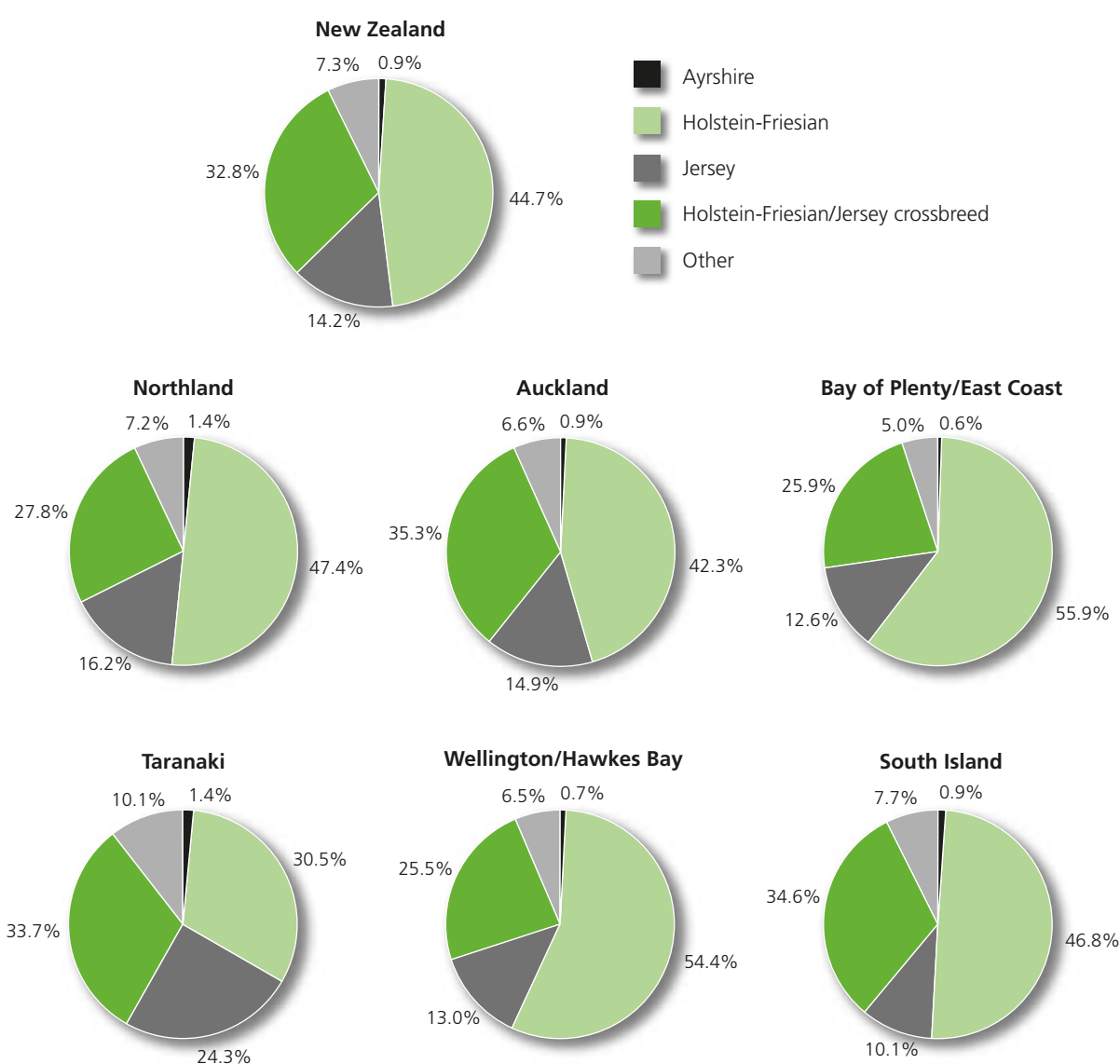
B. Breed breakdown

Three dairy breeds (Holstein-Friesian, Jersey, and Friesian/Jersey crossbreed) dominate the dairy cow inseminations carried out in New Zealand, as recorded on the LIC National Database.

The Jersey breed dominated the national dairy herd until the late 1960s. By 1970, Holstein-Friesian was the dominant dairy breed in New Zealand, as a result of changes in farm management practices and farmers raising larger numbers of dairy calves for beef. Of the other breeds of cattle used to inseminate dairy cows, the main beef breed currently in use is Polled Hereford. Other beef breeds used to a lesser degree include Angus, Belgian Blue, and Simmental. Other breeds of dairy cattle present in smaller numbers in New Zealand include Milking Shorthorn, Guernsey and Brown Swiss. Holstein-Friesian/Jersey crossbreed is emerging as a breed in its own right for the insemination of dairy cows.

The percentages of the major dairy breeds for New Zealand and each region are shown in Graph 5.3. Percentages are given for Holstein-Friesian, Jersey, Holstein-Friesian/Jersey crossbreed and Ayrshire cows with the remaining breeds and crossbreeds grouped into "Other". Holstein-Friesian is the prevalent breed in every region except Taranaki, where Holstein-Friesian/Jersey crossbreed is prevalent. Bay of Plenty/East Coast region continues to have the highest percentage of Holstein-Friesian cows (55.9%), Taranaki has the highest proportion of Jerseys (24.3%) and Auckland has the highest proportion of Holstein-Friesian/Jersey crossbreeds (35.3%).

Graph 5.3: Breed percentages of cows in each LIC region in 2007/08



C. Calving

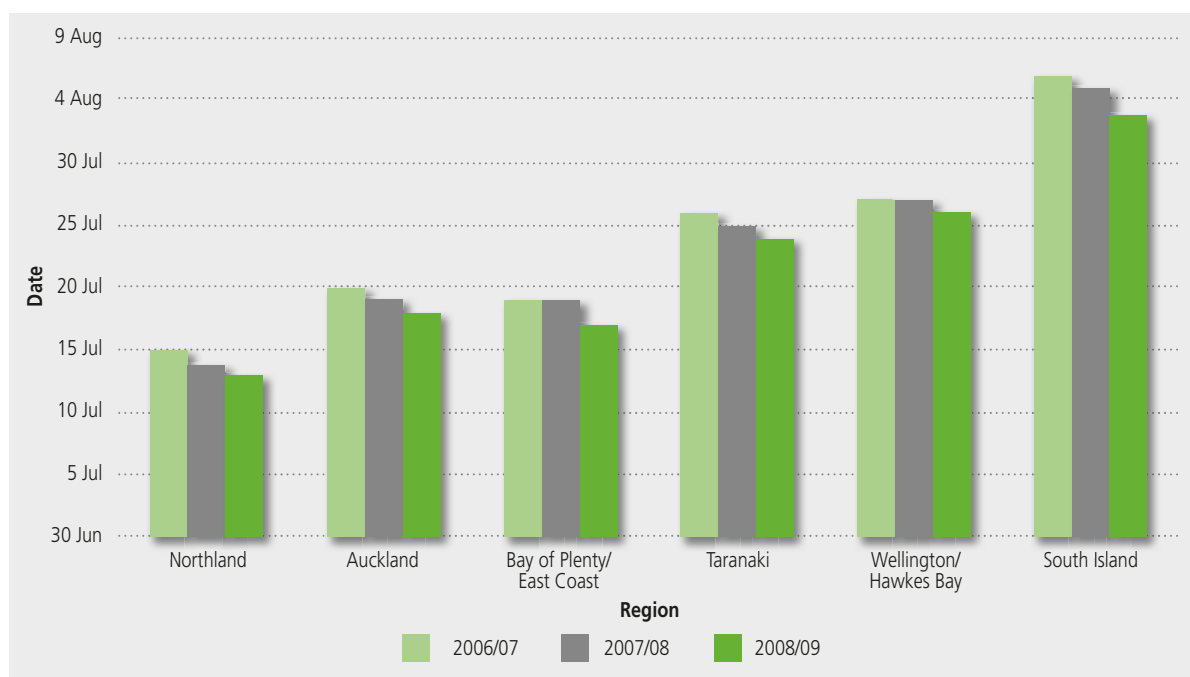
i) Planned start of calving dates

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 282 days from the date 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 Database for approximately 85% of all herds.

The forecast planned start of calving dates for cows (excluding first calvers) for the 2008/09 season compared to the dates previously forecast for 2006/07 and 2007/08 seasons are shown in Graph 5.4.

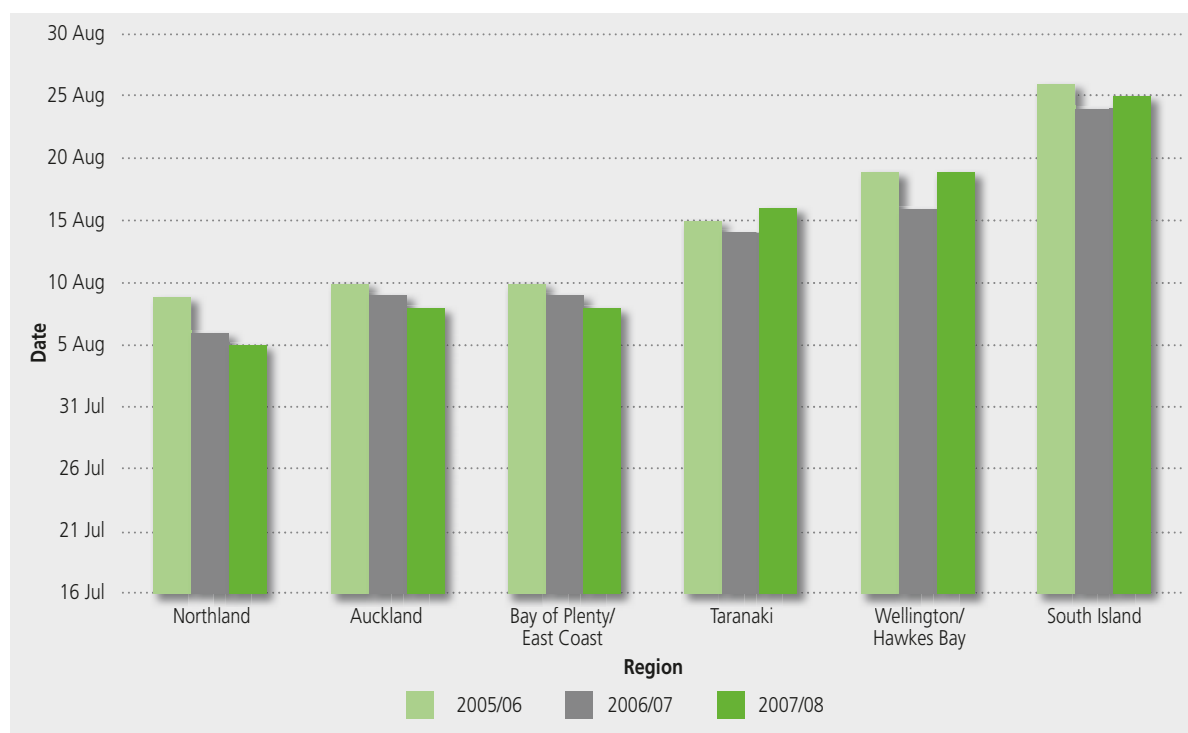
Graph 5.4: Planned start of calving dates for cows (excluding first calvers) by region



ii) Median calving dates

Calving spread can be controlled to some degree by farm management (for example, cow condition score at calving, level of nutrition in the four to six weeks prior to mating, and the use of CIDR devices and other reproductive technology). The actual start of calving can be meaningless, since the first calving in a herd can be premature, occurring well before the rest of the herd calves. Hence 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. Graph 5.5 compares median calving dates for cows (excluding first calvers) for the three most recent seasons.

Graph 5.5: Median calving dates for cows (excluding first calvers) by region



iii) Calving interval

The calving interval for a herd tested 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 herd tested cows calving during the period from 1 June to 31 November. All records where pregnancy terminated prematurely or resulted in abortion or induction were excluded.

Table 5.3: Mean calving interval

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
2000/01	368.2	2,075,300	368.4	1,120,489	368.4	355,463	367.7	491,090	369.3	25,941
2001/02	368.3	2,093,134	368.7	1,091,334	367.8	363,278	367.7	526,610	369.7	25,572
2002/03	368.4	2,109,651	368.6	1,068,842	368.3	365,913	368.0	562,974	369.4	24,175
2003/04	369.0	2,181,103	369.4	1,067,677	368.2	375,598	368.6	620,523	368.9	23,642
2004/05	369.5	2,210,747	370.1	1,040,243	368.8	383,759	369.0	666,562	370.6	23,169
2005/06	367.8	2,241,175	368.2	1,013,546	367.7	390,971	367.4	706,441	368.2	23,129
2006/07	368.9	2,260,512	369.3	1,002,099	369.0	387,357	368.2	739,493	370.4	22,785

D. 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 either 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 63% of all herds.

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 agreement and 50% agreements.

Under the 50% agreement (also called 50/50) the sharemilker owns the herd and any plant and equipment (other than the milking plant) needed to farm the property. The sharemilker is usually responsible for milk harvesting expenses, all 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% 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% 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% agreement, where the owner may have little to do with farm management, a variable order sharemilking agreement often sees the owner heavily involved in management. The variable order sharemilking agreement involves the farm owner retaining ownership of the herd and bearing more of the farm costs, such as hay making and animal health. 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.

Contract milkers 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. In 2007/08, all farms with contract milkers could not be identified, consequently, any farms with contract milkers are included with owner-operators.

- 35% of all milkers are sharemilkers
- 62% 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 5.4. In 2007/08, 4,044 (35%) New Zealand dairy herds operated under a sharemilking agreement. Sixty-two percent (2,515) of all sharemilkers have 50/50 agreements. On average, the smaller properties with smaller herds tend to be owner-operated, while the larger properties with larger herds tend to have sharemilkers.

Table 5.4: Herd analysis by operating structure in 2007/08

Operating structure	Number of herds	Percentage of herds	Average herd size	Average effective hectares	Average cows per effective hectare
Owner-operators	7,215	63.1	341	124	2.78
Sharemilkers:					
Less than 20%	119	1.0	574	184	3.11
20-29%	1,045	9.1	387	135	2.92
30-39%	148	1.3	302	109	2.77
40-44%	25	0.2	240	96	2.56
50/50 (45-54%)	2,515	22.0	354	123	2.92
over 54%	192	1.7	321	122	2.78
All sharemilkers	4,044	35.4	365	127	2.91
Unknown	177	1.5	424	148	2.99
All farms	11,436		351	126	2.83

Note: Contract milkers are included with owner-operators

Herd production in each of the main operating structure groups is shown in Table 5.5. The table shows that on average, sharemilkers on less than 20% agreements have the highest production per herd, per effective hectare and per cow.

Table 5.5: Herd production analysis by operating structure in 2007/08

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	1,260,256	61,533	108,260	490.1	860	175.2	308
Sharemilkers:							
Less than 20%	2,447,721	119,797	212,156	642.9	1,133	204.7	361
20 – 29%	1,417,847	69,745	122,372	520.5	911	178.4	312
30 – 39%	1,031,667	51,015	89,442	456.8	798	163.2	285
40 – 44%	911,628	44,630	78,387	447.8	785	173.4	304
50/50 (45-54%)	1,279,839	63,126	110,779	511.3	895	174.2	305
over 54%	1,144,453	56,671	99,315	471.4	824	170.9	299
All sharemilkers	1,332,081	65,640	115,233	513.2	898	175.6	308
Unknown	1,498,169	72,672	128,131	491.9	864	160.8	283
All farms	1,289,337	63,158	111,033	498.3	873	175.2	307

Note: Contract milkers are included with owner-operators

Changes to the operating structure in the last ten seasons are minimal. Table 5.6 shows the percentage of herds in each operating structure type, whereas Table 5.7 gives the actual number of herds.

Table 5.6: Trend in the percentage of herds in each operating structure for the last 10 seasons

Operating structure	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Owner-operators	62.7	62.7	61.8	62.1	62.5	62.7	63.7	63.9	63.4	63.1
Contract	1.1	0.9	0.8	**	**	**	**	**	**	**
Sharemilkers:										
29%	0.8	0.7	*	*	*	*	*	*	*	*
39%	0.5	0.5	*	*	*	*	*	*	*	*
50%	23.7	23.7	24.3	23.7	23.7	24.1	23.6	23.2	22.6	22.0
Other	11.2	11.5	13.1	14.1	13.2	13.0	12.5	12.6	12.8	13.4
All sharemilkers	36.2	36.4	37.3	37.8	36.9	37.1	36.1	35.8	35.4	35.4
Unknown	0.0	0.0	0.0	0.1	0.5	0.2	0.2	0.2	1.2	1.5

** Included with owner-operators

* Included in "Other"

From 1989/90 owner-operators includes leased farms

Table 5.7: Trend in the number of herds in each operating structure for the last 10 seasons

Operating structure	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Owner-operators	9,005	8,694	8,592	8,476	8,215	8,000	7,820	7,594	7,374	7,215
Contract	154	126	113	**	**	**	**	**	**	**
Sharemilkers:										
29%	114	98	*	*	*	*	*	*	*	*
39%	76	66	*	*	*	*	*	*	*	*
50%	3,403	3,280	3,372	3,240	3,114	3,072	2,897	2,758	2,634	2,515
Other	1,610	1,597	1,815	1,924	1,740	1,658	1,531	1,502	1,488	1,529
All sharemilkers	5,203	5,041	5,187	5,164	4,854	4,730	4,428	4,260	4,122	4,044
Unknown	0	0	0	9	71	21	23	29	134	177
Total	14,362	13,861	13,892	13,649	13,140	12,751	12,271	11,883	11,630	11,436

** Included with owner-operators

* Included in "Other"

From 1989/90 owner-operators includes leased farms

Table 5.8 compares the number (and percentage) of owner-operators with sharemilkers by region. A greater relative percentage of owner-operators are in Northland, West Coast, North Canterbury and Wellington (compared with the percentage of sharemilkers). Conversely, there is a greater relative percentage of sharemilkers in South Auckland, Taranaki and Otago.

Table 5.8: Operating structure by region in 2007/08

<i>Farming region</i>	<i>Owner-operators</i>	<i>Owner-operators %</i>	<i>All sharemilkers</i>	<i>All sharemilkers %</i>	<i>50/50 sharemilkers</i>	<i>50/50 sharemilkers %</i>	<i>Variable order sharemilkers</i>	<i>Variable order sharemilkers %</i>	<i>Total herds (excl. unknown)</i>
Northland	681	9.4	240	5.9	150	6.0	90	5.9	921
Central Auckland	298	4.1	171	4.2	112	4.5	59	3.9	469
South Auckland	2,154	29.9	1,341	33.2	911	36.2	430	28.1	3,495
Bay of Plenty	390	5.4	217	5.4	136	5.4	81	5.3	607
Central Plateau	271	3.8	170	4.2	94	3.7	76	5.0	441
Western Uplands	46	0.6	31	0.8	15	0.6	16	1.0	77
East Coast	10	0.1	2	0.0	1	0.0	1	0.1	12
Hawkes Bay	54	0.7	10	0.2	6	0.2	4	0.3	64
Taranaki	1,063	14.7	729	18.0	416	16.5	313	20.5	1,792
Wellington	380	5.3	172	4.3	97	3.9	75	4.9	552
Wairarapa	323	4.5	152	3.8	91	3.6	61	4.0	475
North Island	5,670	78.6	3,235	80.0	2,029	80.7	1,206	78.9	8,905
Nelson/Marlborough	182	2.5	66	1.6	41	1.6	25	1.6	248
West Coast	282	3.9	85	2.1	45	1.8	40	2.6	367
North Canterbury	378	5.2	159	3.9	98	3.9	61	4.0	537
South Canterbury	108	1.5	59	1.5	28	1.1	31	2.0	167
Otago	158	2.2	167	4.1	108	4.3	59	3.9	325
Southland	437	6.1	273	6.8	166	6.6	107	7.0	710
South Island	1,545	21.4	809	20.0	486	19.3	323	21.1	2,354
New Zealand	7,215	100.0	4,044	100.0	2,515	100.0	1,529	100.0	11,259

Table 5.9 shows that smaller herds (less than 200 cows) are predominantly farmed by owner-operators, while a greater relative percentage of sharemilkers operate larger herds (over 200 cows). Very large herds (over 650 cows) are operated by both owner-operators and sharemilkers in similar percentages.

Table 5.9: Operating structure by herd size in 2007/08

<i>Herd size</i>	<i>Owner-operators</i>	<i>Owner-operators %</i>	<i>All sharemilkers</i>	<i>All sharemilkers %</i>	<i>50/50 sharemilkers</i>	<i>50/50 sharemilkers %</i>	<i>Variable order sharemilkers</i>	<i>Variable order sharemilkers %</i>	<i>Total herds (excl. unknown)</i>
10-49	13	0.2	0	0.0	0	0.0	0	0.0	13
50-99	264	3.7	22	0.5	11	0.4	11	0.7	286
100-149	762	10.6	182	4.5	113	4.5	69	4.5	944
150-199	1,051	14.6	513	12.7	365	14.5	148	9.7	1,564
200-249	1,177	16.3	656	16.2	444	17.7	212	13.9	1,833
250-299	776	10.8	540	13.4	357	14.2	183	12.0	1,316
300-349	741	10.3	491	12.1	263	10.5	228	14.9	1,232
350-399	429	5.9	313	7.7	173	6.9	140	9.2	742
400-449	395	5.5	320	7.9	189	7.5	131	8.6	715
450-499	291	4.0	214	5.3	125	5.0	89	5.8	505
500-549	279	3.9	173	4.3	104	4.1	69	4.5	452
550-599	158	2.2	130	3.2	77	3.1	53	3.5	288
600-649	172	2.4	123	3.0	75	3.0	48	3.1	295
650-699	122	1.7	69	1.7	46	1.8	23	1.5	191
700-749	77	1.1	65	1.6	37	1.5	28	1.8	142
750-799	83	1.2	45	1.1	26	1.0	19	1.2	128
800-849	66	0.9	29	0.7	19	0.8	10	0.7	95
850-899	50	0.7	25	0.6	17	0.7	8	0.5	75
900-949	62	0.9	22	0.5	14	0.6	8	0.5	84
950-999	39	0.5	20	0.5	12	0.5	8	0.5	59
1000+	208	2.9	92	2.3	48	1.9	44	2.9	300
Total/Avg	7,215	100.0	4,044	100.0	2,515	100.0	1,529	100.0	11,259

6. Disease control

A. New Zealand dairy herd Enzootic Bovine Leucosis (EBL) control scheme

LIC continued to administer the New Zealand dairy industry enzootic bovine leucosis (EBL) scheme in 2007/08 with funding from DairyNZ Incorporated through the levy. Bulk milk screening of almost two thirds of all New Zealand dairy herds identified two EBL reactor herds. All infected cattle were culled and no positive herds remained in NZ at the end of the season.

NZ dairy herd EBL status

- *Over 60% of New Zealand dairy herds were tested for EBL in the course of the 2007/08 season*
- *Two incident EBL herds were identified as a result of the bulk milk screening. Infection was promptly suppressed in both herds*
- *Annual EBL herd incidence and prevalence have remained below 0.1% for four consecutive seasons*
- *No EBL reactors have been detected in the North Island since the 2005/06 season*
- *Poor animal identification and recording in a small proportion of NZ dairy herds are the primary reason that occasional EBL cases persist in the South Island*

Incident herds

In one incident EBL herd, the source of infection was traced to carry-over dry cows introduced into the milking herd in the spring of 2007. The infected dry cows evaded testing and detection during an earlier EBL outbreak because of a lack of recording and tracking systems on the farm.

The second incident herd with a single reactor cow purchases adult replacement stock, and also lacks good records. Tracing the original source of infection was therefore not possible.

Continued EBL screening

Herd monitoring will be maintained during 2008/09 at a similar intensity to ensure all herds are tested at least once every two years, with intensive management and culling of any EBL infection in incident herds. The continued absence of EBL infected dairy herds in the North Island clearly shows that the South Island presents a greater – albeit very small – EBL risk. Therefore South Island herds will be monitored more intensively; every South Island herd will be screened to ensure quick detection and resolution of remnant EBL infections.

During 2009 a review of the EBL scheme will be undertaken in consultation with the stakeholders to determine its future direction.

B. Tuberculosis (Tb) control

Control of Tb (*M. bovis*) over the agricultural industry is managed by the Animal Health Board, 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 that are considered a source of infection (e.g., possums and ferrets).

Table 6.1: Tuberculosis (Tb) testing and results in 2007/08

Region	Vector Status	Number of infected dairy herds June 2008	Number of dairy cattle primary tested	Number of Tuberculous ^a dairy cattle
Northland	Free	0	86,914	0
Auckland	Free	0	33,733	0
Waikato	Free	7	1,126,335	49
	Risk	4	137,452	16
Bay of Plenty	Free	1	75,184	3
	Risk	0	8,558	2
Gisborne	Free	0	0	0
Hawke's Bay	Free	0	12,450	1
	Risk	0	44,459	22
Taranaki	Free	0	142,760	2
Manawatu/Wanganui	Free	0	109,355	0
	Risk	0	68,583	2
Wellington	Risk	1	99,009	6
North Island	Free	8	1,586,731	55
	Risk	5	358,061	48
North Island	Total	13	1,944,792	103
Marlborough	Free	0	3,902	0
	Risk	0	1,907	0
Tasman/Nelson	Free	0	42,009	0
	Risk	0	14,389	0
West Coast	Free	0	4,464	3
	Risk	37	222,886	165
Canterbury	Free	4	267,655	16
	Risk	3	113,343	32
Otago	Free	1	112,399	31
	Risk	6	115,110	47
Southland	Free	0	149,527	4
	Risk	0	91,586	1
South Island	Free	5	579,956	54
	Risk	46	559,221	245
South Island	Total	51	1,139,177	299
New Zealand	Free	13	2,166,687	109
	Risk	51	917,282	293
New Zealand	Total	64	3,083,969	402

Sourced from Animal Health Board – Annual Report for the year ending 30 June 2008

^a Tuberculous animals include lesioned reactor cattle and lesioned cull cattle

Appendix 1: Farming regions and districts

The following map shows the six LIC regions and the farming regions used in all analyses presented in this report. The list of districts, which follow local authority boundaries, within each region is also given.

1 Northland

Far North
Whangarei
Kaipara

2 Central Auckland

Rodney
North Shore
Waitakere
Auckland
Manukau
Papakura
Franklin

3 South Auckland

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 Wellington

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

