

IN THE AUSTRALIAN COMPETITION TRIBUNAL

of 2013

MURRAY GOULBURN CO-OPERATIVE CO LIMITED

**RE: PROPOSED ACQUISITION OF WARRNAMBOOL CHEESE
AND BUTTER FACTORY COMPANY HOLDINGS LIMITED**

Certificate identifying annexure

This is the annexure marked **MB10** now produced and shown to Maldwyn Beniston at the time of signing his statement on 28 November 2013.

Annexure MB10
New Zealand Dairy Statistics 2011-2012

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New Zealand Dairy Statistics 2011-12



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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 are sourced from the LIC National Database, dairy companies, Animal Evaluation database, Animal Health Board Annual Report (year ending 30 June 2012), Real Estate Institute of New Zealand, and Statistics New Zealand.

New Zealand Dairy Statistics 2011/12 is a report that shows historical information up to and including the 2011/12 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

- 11.3% increase in milksolids processed

In 2011/12, dairy companies processed 19.1 billion litres of milk containing 1.69 billion kilograms of milksolids (Table 2.1). Total milksolids processed increased by a staggering 11.3% from the 1.51 billion kilograms processed in the previous season. The increase in milk production was the first double digit increase since 2000-01 and was due to a lift in milksolids production per cow (80%) and more cows milked (20%).

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)
1977/78	5,238	251	186	437
1978/79	5,655	274	203	477
1979/80	5,997	291	215	506
1980/81	5,868	282	209	491
1981/82	5,979	282	209	491
1982/83	6,096	290	214	505
1983/84	6,733	324	239	564
1984/85	6,965	332	245	578
1985/86	7,326	350	257	609
1986/87	6,385	301	222	524
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

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.

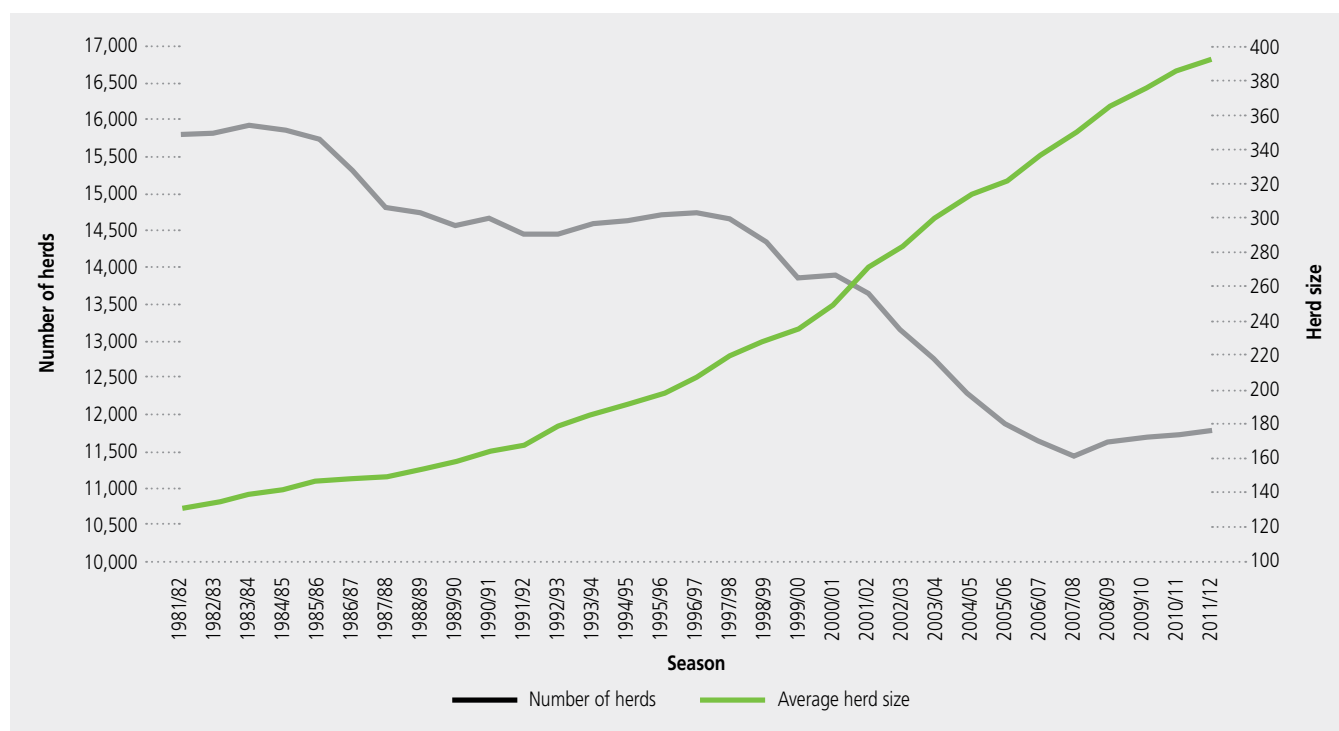
ii) Population

- Slight increase in the number of herds
- Average herd size continues to increase
- Cow numbers increase by 105,500 to 4.6 million cows

Between 1980/81 and 2007/08 total herd numbers declined at an average rate of about 170 herds per season (Graph 2.1). However, the total number of herds in the 2011/12 season increased by 63 (to 11,798), over the previous season. This was the fourth consecutive season of small increases in herd numbers.

The average herd size was 393 in 2011/12, up 7 cows on the previous season. The increase is consistent with the trend for the past 30 seasons. The average herd size has more than tripled in the last 30 seasons, and has increased by more than 120 cows in the last 10 seasons. Expansion of the dairy herd in the South Island has assisted 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 2011/12 season was 4.6 million (Table 2.2), an increase of 2.3% over the previous season. Average effective hectares is steady at 139 hectares. A stocking rate of 2.83 cows per hectare was up on the previous season and similar to the 2009/10 season. Total effective hectares (runoff excluded) were 1.64 million – the same as the previous season.

Table 2.2: Summary of herd statistics since 1974/75

Season	Herds	Total cows	Total effective hectares ^a	Average herd size	Average effective hectares ^b	Average cows per hectare ^b
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	996,723	130	63	2.07
1982/83	15,816	2,128,199	1,012,224	135	64	2.10
1983/84	15,932	2,209,725	1,035,580	139	65	2.13
1984/85	15,881	2,280,273	1,016,384	144	64	2.24
1985/86	15,753	2,321,012	1,008,192	147	64	2.30
1986/87	15,315	2,281,849	995,475	149	65	2.29
1987/88	14,818	2,236,290	963,170	151	65	2.32
1988/89	14,744	2,269,073	973,104	154	66	2.33
1989/90	14,595	2,313,822	977,865	159	67	2.37
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

- Not available

^a Total effective hectares between 1981/82 and 1999/00 are estimates.

^b 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. In 2009/10 a change was made to the way the average cows per hectare was calculated. This change is now reflected in all seasons reported.

B. Herd production statistics

• Milk production up on last season

Herd production has increased most years since 1992/93 (Table 2.3). Exceptions were evident in 1998/99 and 2007/08, when production dropped markedly due to unfavourable weather conditions. The average milksolids per effective hectare of 1,028 kg in 2011/12 was a new record. Production per cow increased by 9.0% in 2011/12 to an average of 364 kg milksolids (comprising 206 kg milkfat and 158 kg protein).

Table 2.3: Summary of herd production for the last 35 seasons

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
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	v3,737	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

- Not available

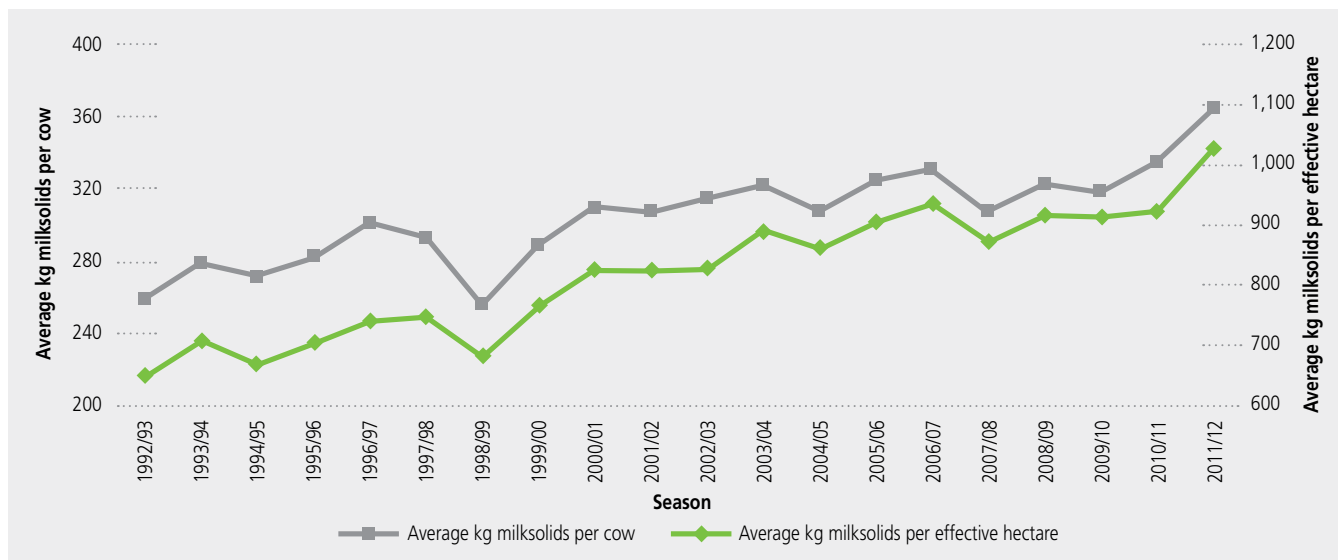
^a Figures prior to 1991/92 exclude town milk herds

^b 1991/92 figures include some town milk herds

i) Production per cow and per hectare

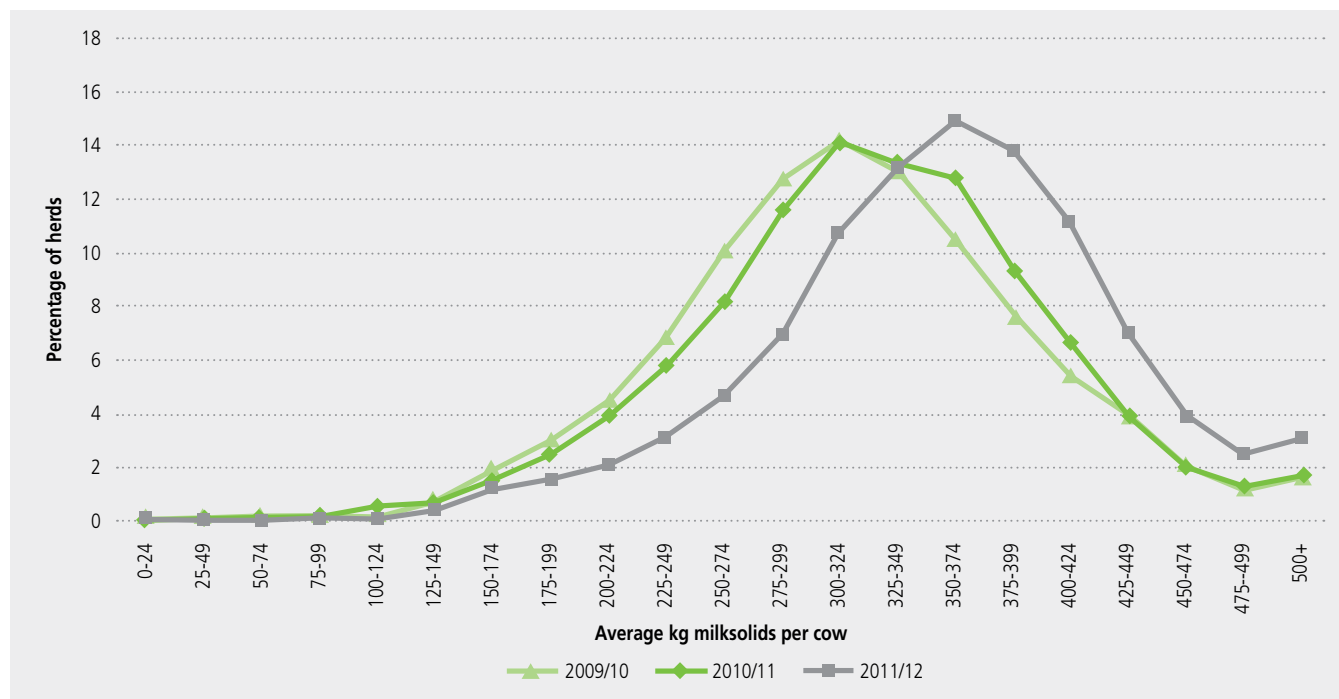
Average milksolids per cow in 2011/12 reached 364 kg, the highest on record (Graph 2.2). Average milk production per hectare was 1,028 kg – the first time that it has surpassed 1,000 kg. Variations from season to season are masked by the considerable effect of the weather on each season's actual production. For example, widespread drought in 2007/08 caused milk production to decline while in 2011/12 favourable pasture growth conditions throughout the season enabled record milk production.

Graph 2.2: Milksolid 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, 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 2011/12 compared with the previous two seasons. Twenty-eight percent of the herds had an average production of over 400 kilograms milksolids per cow, compared with 16% the previous season.

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



ii) Herd size distribution

- 10% of herds have 750 or more cows

A little under fifty percent (5,629) of herds have between 150 and 349 cows (Table 2.4). In 2011/12, 6,308 herds (53%) had 300 or more cows, 2,964 (25%) had 500 or more cows and 493 (4%) had 1,000 cows or more. A decade ago (2001/02) only 30% of herds had 300 or more cows and 9% had 500 or more cows. Averages of milkfat, protein and milksolids per cow, by herd size, are also included in Table 2.4.

Aside from the 16 herds with fewer than 50 animals, the average milksolids per cow varies between 283 kg (herds with 50-99 cows) and 383 kg (herds with 650-699 cows).

Table 2.4: Average production per cow by herd size in 2011/12

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	16	0.1	555	0.0	230	170	399
50-99	265	2.2	20,645	0.4	161	122	283
100-149	802	6.8	100,172	2.2	186	141	327
150-199	1,454	12.3	251,546	5.4	197	148	345
200-249	1,713	14.5	378,297	8.2	204	153	357
250-299	1,240	10.5	334,088	7.2	205	155	359
300-349	1,222	10.4	389,474	8.4	206	156	362
350-399	790	6.7	290,854	6.3	209	159	367
400-449	762	6.5	318,115	6.9	212	160	372
450-499	570	4.8	266,959	5.8	209	159	368
500-549	533	4.5	274,663	5.9	210	161	372
550-599	380	3.2	215,776	4.7	210	162	372
600-649	385	3.3	236,788	5.1	216	166	382
650-699	273	2.3	181,832	3.9	216	167	383
700-749	227	1.9	162,254	3.5	215	166	382
750-799	186	1.6	142,089	3.1	215	166	381
800-849	159	1.3	129,676	2.8	214	166	380
850-899	121	1.0	104,447	2.3	212	165	378
900-949	126	1.1	115,419	2.5	210	163	372
950-999	81	0.7	78,362	1.7	208	162	369
1000-1099	155	1.3	159,593	3.4	210	163	373
1100-1199	98	0.8	110,776	2.4	208	163	371
1200-1499	135	1.1	175,690	3.8	202	159	360
1500+	105	0.9	196,156	4.2	162	127	289
Total/Avg	11,798		4,634,226		206	158	364

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 350 cows since 2006/07. The most common herd size remains in the range of 200 to 249 cows (comprising 14.5% of herds, compared with 16.5% in 2006/07).

Graph 2.4: Herd size distribution for 2011/12 compared with 2006/07



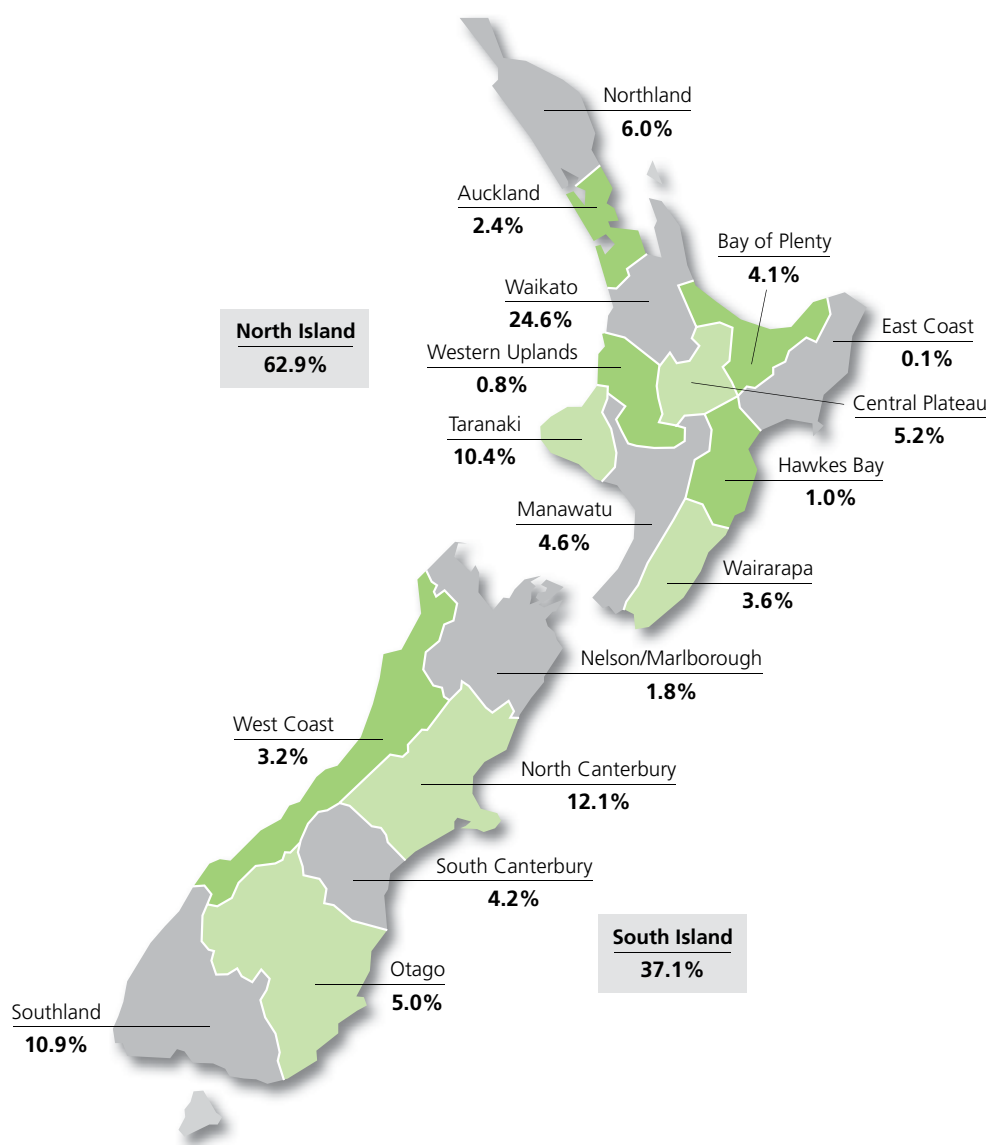
3. Regional dairy statistics

- 37% of all dairy cows are located in the South Island

The majority of dairy herds (76%) are located in the North Island, with the greatest concentration (30%) situated in the Waikato region. Taranaki, with 15% of dairy herds, is the next largest region on a herd basis.

Although South Island dairy herds account for 24% of the national total, they contain 37% of all cows (Graph 3.1). Twenty-five percent of all dairy cows are located in the Waikato region, followed by North Canterbury (12%), Southland (11%) and Taranaki (10%). This is the first time Southland has surpassed Taranaki in cow numbers.

Graph 3.1: Regional distribution of dairy cows in 2011/12



- More than 1.7 million cows in the South Island
- Largest average herd size (779) in South Canterbury
- South Island average herd sizes increasing faster than North Island

Farms in the South Island are, on average, larger than those in the North Island (in terms of both farm area and cow numbers, see Table 3.1). Sixty-three percent of all cows are in the North Island, with 25% in the Waikato region. The average herd size in both islands continues to increase. Within the South Island, South Canterbury has the largest average herd size (779 cows). In the North Island, Hawkes Bay has the largest average herd size of 658 cows. The smallest herd sizes are in Auckland, Taranaki, and Northland, averaging 249, 280 and 299 cows respectively. South Canterbury has the highest average cows per hectare (3.44), followed closely by North Canterbury (3.43). The regions with the lowest average cows per hectare are the West Coast (2.18) and Northland (2.27).

Table 3.1: Herd analysis by region in 2011/12

<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	933	7.9	279,429	6.0	123,336	7.5	299	132	2.27
Auckland	440	3.7	109,577	2.4	46,282	2.8	249	105	2.37
Waikato	3,556	30.1	1,139,842	24.6	387,722	23.7	321	109	2.94
Bay of Plenty	597	5.1	191,537	4.1	68,016	4.2	321	114	2.82
Central Plateau	464	3.9	239,485	5.2	89,599	5.5	516	193	2.67
Western Uplands	84	0.7	39,180	0.8	15,927	1.0	466	190	2.46
East Coast	9	0.1	4,807	0.1	1,940	0.1	534	216	2.48
Hawkes Bay	71	0.6	46,713	1.0	16,059	1.0	658	226	2.91
Taranaki	1,731	14.7	484,204	10.4	170,968	10.4	280	99	2.83
Manawatu	562	4.8	212,139	4.6	77,258	4.7	377	137	2.75
Wairarapa	465	3.9	166,803	3.6	61,575	3.8	359	132	2.71
North Island	8,912	75.5	2,913,716	62.9	1,058,682	64.6	327	119	2.75
Nelson/Marlborough	237	2.0	84,423	1.8	30,403	1.9	356	128	2.78
West Coast	374	3.2	146,925	3.2	67,364	4.1	393	180	2.18
North Canterbury	724	6.1	559,490	12.1	163,106	10.0	773	225	3.43
South Canterbury	248	2.1	193,092	4.2	56,169	3.4	779	226	3.44
Otago	399	3.4	230,837	5.0	77,230	4.7	579	194	2.99
Southland	904	7.7	505,743	10.9	185,592	11.3	559	205	2.73
South Island	2,886	24.5	1,720,510	37.1	579,864	35.4	596	201	2.97
New Zealand	11,798		4,634,226		1,638,546		393	139	2.83

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

South Island farms have, on average, higher per herd production than herds in the North Island, with South Canterbury recording the highest average herd production at 307,611 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 230,022 kilograms of milksolids, reflecting large herd sizes.

In 2011/12, 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 (1,361 kg), while Waikato had the highest average milksolids production per hectare in the North Island (1,057 kg).

North Canterbury also had the highest average milksolids per cow (397 kg), followed by South Canterbury (395 kg). In the North Island, Central Plateau had the highest average milksolids per cow (363 kg), followed by Manawatu (360 kg) and Waikato (359 kg).

Table 3.2: Herd production analysis by region in 2011/12

Farming region	Total kg milksolids	Percent milk-solids	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	87,978,433	5.2	1,087,190	53,683	40,613	94,296	406	307	713	179	136	315
Auckland	36,909,688	2.2	977,388	47,501	36,384	83,886	452	346	798	191	146	337
Waikato	409,688,849	24.3	1,313,365	65,522	49,689	115,211	601	456	1,057	204	155	359
Bay of Plenty	66,552,788	3.9	1,291,856	63,415	48,063	111,479	557	422	978	198	150	347
Central Plateau	86,971,830	5.2	2,157,663	106,759	80,681	187,439	553	418	971	207	156	363
Western Uplands	12,572,857	0.7	1,686,471	85,428	64,249	149,677	451	339	789	183	138	321
East Coast	1,339,619	0.1	1,745,234	84,752	64,094	148,847	393	297	691	159	120	279
Hawkes Bay	16,331,527	1.0	2,668,298	129,204	100,818	230,022	571	446	1,017	196	153	350
Taranaki	173,369,303	10.3	1,091,876	57,440	42,716	100,156	582	432	1,014	205	153	358
Manawatu	76,317,591	4.5	1,587,043	76,536	59,260	135,796	557	431	988	203	157	360
Wairarapa	59,089,049	3.5	1,429,472	72,304	54,770	127,073	546	414	960	202	153	354
North Island	1,027,121,535	61.0	1,310,660	65,592	49,660	115,252	552	418	970	201	152	353
Nelson/Marlborough	29,568,873	1.8	1,387,784	71,432	53,331	124,763	557	416	973	201	150	350
West Coast	49,642,978	2.9	1,440,682	76,409	56,326	132,735	424	313	737	195	143	338
North Canterbury	221,976,456	13.2	3,496,107	171,467	135,130	306,597	761	600	1,361	222	175	397
South Canterbury	76,287,585	4.5	3,519,402	171,957	135,654	307,611	759	599	1,358	221	174	395
Otago	87,034,070	5.2	2,493,611	122,238	95,892	218,131	632	495	1,127	211	166	377
Southland	193,253,045	11.5	2,413,006	120,067	93,708	213,775	585	456	1,041	215	168	382
South Island	657,763,007	39.0	2,580,742	128,069	99,846	227,915	637	497	1,134	215	167	382
New Zealand	1,684,884,542	100.0	1,621,344	80,875	61,936	142,811	582	446	1,028	206	158	364

South Taranaki continues to be the district with the most herds (1,040) followed by Matamata-Piako (1,004). The Southland district has the most cows (384,569), followed by South Taranaki (312,823) (Table 3.3). Ashburton in North Canterbury has the highest average herd size with 859 cows. The next largest is Hurunui, also in North Canterbury, with 851 cows. The number of owner-operators and sharemilkers is included in table 3.3.

Table 3.3: Herd analysis by district in 2011/12

Region	District	Total herds	Number of owner-operators	Number of sharemilkers	Total cows	Total effective hectares	Average herd size	Average effective hectares	Average cows per hectare
Northland	Far North	262	203	59	72,686	33,250	277	127	2.19
	Whangarei	313	232	81	100,196	41,838	320	134	2.39
	Kaipara	358	276	82	106,547	48,248	298	135	2.21
Auckland	Rodney	166	113	53	44,047	19,383	265	117	2.27
	Manukau/Papakura City	18	9	9	3,522	1,391	196	77	2.53
	Franklin	256	156	100	62,008	25,508	242	100	2.43
Waikato	Waikato	681	443	238	222,380	78,991	327	116	2.82
	Hamilton City	14	7	7	4,034	1,352	288	97	2.98
	Waipa	582	380	202	196,784	63,974	338	110	3.08
	Otorohanga	382	243	139	136,663	47,534	358	124	2.88
	Thames-Coromandel	91	59	32	24,960	9,698	274	107	2.57
	Hauraki	415	277	138	115,096	42,002	277	101	2.74
	Matamata-Piako	1,004	603	401	295,146	94,477	294	94	3.12
Bay of Plenty	South Waikato	387	245	142	144,779	49,694	374	128	2.91
	Western Bay of Plenty	198	140	58	67,137	23,020	339	116	2.92
	Tauranga	14	11	3	3,851	1,393	275	100	2.76
	Kawerau/Whakatane	307	216	91	96,442	34,770	314	113	2.77
	Opotiki	78	45	33	24,107	8,833	309	113	2.73
Central Plateau	Taupo	149	102	47	105,981	40,576	711	272	2.61
	Rotorua	315	198	117	133,504	49,023	424	156	2.72
Western Uplands	Waitomo	58	40	18	27,910	11,454	481	197	2.44
	Ruapehu	26	14	12	11,270	4,473	433	172	2.52
East Coast	Gisborne / Wairoa	9	7	2	4,807	1,940	534	216	2.48
Hawkes Bay	Napier / Hastings	31	25	6	19,101	6,487	616	209	2.94
	Central Hawkes Bay	40	32	8	27,612	9,572	690	239	2.88
Taranaki	New Plymouth	443	277	166	110,970	42,155	250	95	2.63
	Stratford	248	168	80	60,411	22,455	244	91	2.69
	South Taranaki	1,040	572	468	312,823	106,358	301	102	2.94
Manawatu	Wanganui	20	15	5	7,116	3,310	356	166	2.15
	Rangitikei	93	70	23	41,958	14,635	451	157	2.87
	Manawatu	257	186	71	93,765	34,092	365	133	2.75
	Palmerston North City	51	39	12	17,815	6,686	349	131	2.66
	Horowhenua	120	93	27	45,565	16,125	380	134	2.83
	Kapiti Coast / Upper Hutt	21	15	6	5,920	2,410	282	115	2.46
Wairarapa	Tararua	307	209	98	99,511	36,597	324	119	2.72
	Masterton	17	13	4	8,075	2,763	475	163	2.92
	Carterton	58	47	11	20,801	8,219	359	142	2.53
	South Wairarapa	83	59	24	38,416	13,996	463	169	2.74
North Island		8,912	5,839	3,073	2,913,716	1,058,682	327	119	2.75

(Table 3.3 continued)

Region	District	Total herds	Number of owner-operators	Number of share-milkers	Total cows	Total effective hectares	Average herd size	Average effective hectares	Average cows per hectare
Nelson/Marlborough	Marlborough	59	49	10	17,593	6,309	298	107	2.79
	Kaikoura	24	16	8	10,074	3,367	420	140	2.99
	Tasman / Nelson City	154	132	22	56,756	20,727	369	135	2.74
West Coast	Buller	130	104	26	49,690	22,270	382	171	2.23
	Grey	86	61	25	39,642	17,584	461	204	2.25
	Westland	158	124	34	57,593	27,510	365	174	2.09
North Canterbury	Hurunui	75	55	20	63,824	18,098	851	241	3.53
	Waimakariri	91	62	29	52,812	15,349	580	169	3.44
	Christchurch City	11	6	5	7,653	2,154	696	196	3.55
	Banks Peninsula	9	5	4	2,080	928	231	103	2.24
	Selwyn	203	154	49	145,202	45,213	715	223	3.21
	Ashburton	335	220	115	287,919	81,364	859	243	3.54
South Canterbury	Timaru	133	88	45	98,739	28,005	742	211	3.53
	MacKenzie	15	11	4	11,392	3,659	759	244	3.11
	Waimate	100	58	42	82,961	24,505	830	245	3.39
Otago	Waitaki	125	57	68	90,272	26,863	722	215	3.36
	Dunedin City	66	34	32	26,122	9,599	396	145	2.72
	Clutha	190	105	85	101,913	36,669	536	193	2.78
	Central Otago	18	12	6	12,530	4,099	696	228	3.06
Southland	Gore	152	99	53	83,699	30,553	551	201	2.74
	Invercargill	67	46	21	37,475	13,402	559	200	2.80
	Southland	685	427	258	384,569	141,637	561	207	2.72
South Island		2,886	1,925	961	1,720,510	579,864	596	201	2.97
New Zealand		11,798	7,764	4,034	4,634,226	1,638,546	393	139	2.83

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

Hurunui district had the highest average production per herd with 337,044 kilograms of milksolids (Table 3.4). Ashburton had the highest average kilograms of milksolids per effective hectare (1,436). MacKenzie district recorded the highest production per cow (425 kg of milksolids). The North Island district that has the highest milksolids production per herd is Taupo with an average of 254,425 kilograms of milksolids. On a per-hectare basis Masterton produced the highest average kilograms of milksolids (1,166). Masterton also produced the highest average kilograms of milksolids per cow (399).

Table 3.4: Herd production analysis by district in 2011/12

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	994,335	48,437	36,861	85,298	382	290	672	175	133	307
	Whangarei	1,170,738	58,833	44,109	102,942	440	330	770	184	138	322
	Kaipara	1,082,100	53,020	40,302	93,322	393	299	692	178	135	314
Auckland	Rodney / Auck. City	959,461	47,881	36,212	84,093	410	310	720	180	136	317
	Manukau City / Papakura	792,644	36,972	28,904	65,877	478	374	852	189	148	337
	Franklin	1,002,002	47,996	37,022	85,018	482	372	853	198	153	351
Waikato	Waikato	1,288,351	63,566	48,144	111,710	548	415	963	195	147	342
	Hamilton City	1,203,317	59,038	45,129	104,167	611	467	1,079	205	157	362
	Waipa	1,408,972	70,355	53,427	123,782	640	486	1,126	208	158	366
	Otorohanga	1,422,142	71,424	54,089	125,514	574	435	1,009	200	151	351
	Thames-Coromandel	1,055,298	52,595	39,766	92,360	494	373	867	192	145	337
	Hauraki	1,109,098	55,148	41,882	97,030	545	414	959	199	151	350
	Matamata-Piako	1,203,655	60,871	45,927	106,798	647	488	1,135	207	156	363
South Waikato	1,674,560	82,333	63,071	145,404	641	491	1,132	220	169	389	
Bay of Plenty	Western Bay of Plenty	1,325,924	66,725	49,896	116,620	574	429	1,003	197	147	344
	Tauranga	951,009	46,741	35,635	82,377	470	358	828	170	130	299
	Kawerau/Whakatane	1,316,811	63,620	48,590	112,211	562	429	991	203	155	357
	Opotiki	1,168,329	57,201	43,568	100,769	505	385	890	185	141	326
Central Plateau	Taupo	2,911,390	144,749	109,676	254,425	532	403	934	204	154	358
	Rotorua	1,801,138	88,789	66,965	155,754	571	430	1,001	209	158	367
Western Uplands	Waitomo	1,695,880	86,140	64,765	150,905	436	328	764	179	135	314
	Ruapehu	1,665,481	83,841	63,097	146,938	487	367	854	193	146	339
East Coast	Gisborne / Wairoa	1,745,234	84,752	64,094	148,847	393	297	691	159	120	279
Hawkes Bay	Napier/Hastings	2,323,128	113,120	86,777	199,897	541	415	955	184	141	324
	Central Hawkes Bay	2,935,804	141,669	111,699	253,368	592	467	1,059	205	162	367
Taranaki	New Plymouth	958,318	50,134	37,149	87,283	527	390	917	200	148	348
	Stratford	943,548	48,796	36,490	85,286	539	403	942	200	150	350
	South Taranaki	1,184,137	62,613	46,571	109,185	612	455	1,068	208	155	363
Manawatu	Wanganui	1,524,923	69,596	55,037	124,632	421	333	753	196	155	350
	Rangitikei	1,873,459	90,733	70,580	161,314	577	449	1,025	201	156	358
	Manawatu	1,521,277	73,972	56,931	130,904	558	429	987	203	156	359
	Palmerston North City	1,415,862	68,631	53,338	121,969	524	407	930	196	153	349
	Horowhenua	1,655,660	79,175	61,393	140,568	589	457	1,046	209	162	370
Kapiti Coast / Upper Hutt	1,206,270	55,773	43,847	99,620	486	382	868	198	156	353	
Wairarapa	Tararua	1,266,763	64,893	48,658	113,551	544	408	953	200	150	350
	Masterton	2,174,641	107,062	82,463	189,525	659	507	1,166	225	174	399
	Carterton	1,496,362	73,974	56,848	130,822	522	401	923	206	159	365
	South Wairarapa	1,831,934	91,426	70,252	161,677	542	417	959	198	152	349
North Island		1,310,660	65,592	49,660	115,252	552	418	970	201	152	353

(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	1,231,118	62,217	46,621	108,838	582	436	1,018	209	156	365
	Kaikoura	1,745,662	87,746	66,393	154,139	625	473	1,099	209	158	367
	Tasman/Nelson City	1,392,033	72,420	53,867	126,286	538	400	938	197	146	343
West Coast	Buller	1,390,051	72,631	53,509	126,141	424	312	736	190	140	330
	Grey	1,733,182	91,049	67,777	158,827	445	331	777	198	147	345
	Westland	1,323,132	71,549	52,410	123,959	411	301	712	196	144	340
North Canterbury	Hurunui	3,864,662	189,387	147,657	337,044	785	612	1,397	223	174	396
	Waimakariri	2,582,743	124,142	98,013	222,155	736	581	1,317	214	169	383
	Christchurch City	3,024,577	152,684	117,464	270,148	780	600	1,380	219	169	388
	Banks Peninsula	920,351	43,355	34,135	77,489	420	331	752	188	148	335
	Selwyn	3,140,963	154,560	121,087	275,647	694	544	1,238	216	169	385
	Ashburton	3,961,593	194,614	154,211	348,826	801	635	1,436	226	179	406
South Canterbury	Timaru	3,435,357	165,865	131,914	297,778	788	626	1,414	223	178	401
	MacKenzie	3,665,711	181,011	141,659	322,670	742	581	1,323	238	187	425
	Waimate	3,609,236	178,702	139,728	318,431	729	570	1,299	215	168	384
Otago	Waitaki	3,157,453	155,813	121,943	277,756	725	567	1,292	216	169	385
	Dunedin City	1,732,208	83,623	65,822	149,445	575	453	1,028	211	166	378
	Clutha	2,267,570	110,433	86,933	197,366	572	450	1,023	206	162	368
	Central Otago	3,061,387	155,288	119,812	275,100	682	526	1,208	223	172	395
Southland	Gore	2,330,768	115,230	89,990	205,220	573	448	1,021	209	163	373
	Invercargill	2,412,041	119,212	93,460	212,672	596	467	1,063	213	167	380
	Southland	2,431,348	121,224	94,558	215,782	586	457	1,044	216	168	384
South Island		2,580,742	128,069	99,846	227,915	637	497	1,134	215	167	382
New Zealand		1,621,344	80,875	61,936	142,811	582	446	1,028	206	158	364

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 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.

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 culling or drying off), high producers (for breeding), and cows with mastitis (for therapy or culling).

- *Herd-testing increased in 2011/12*

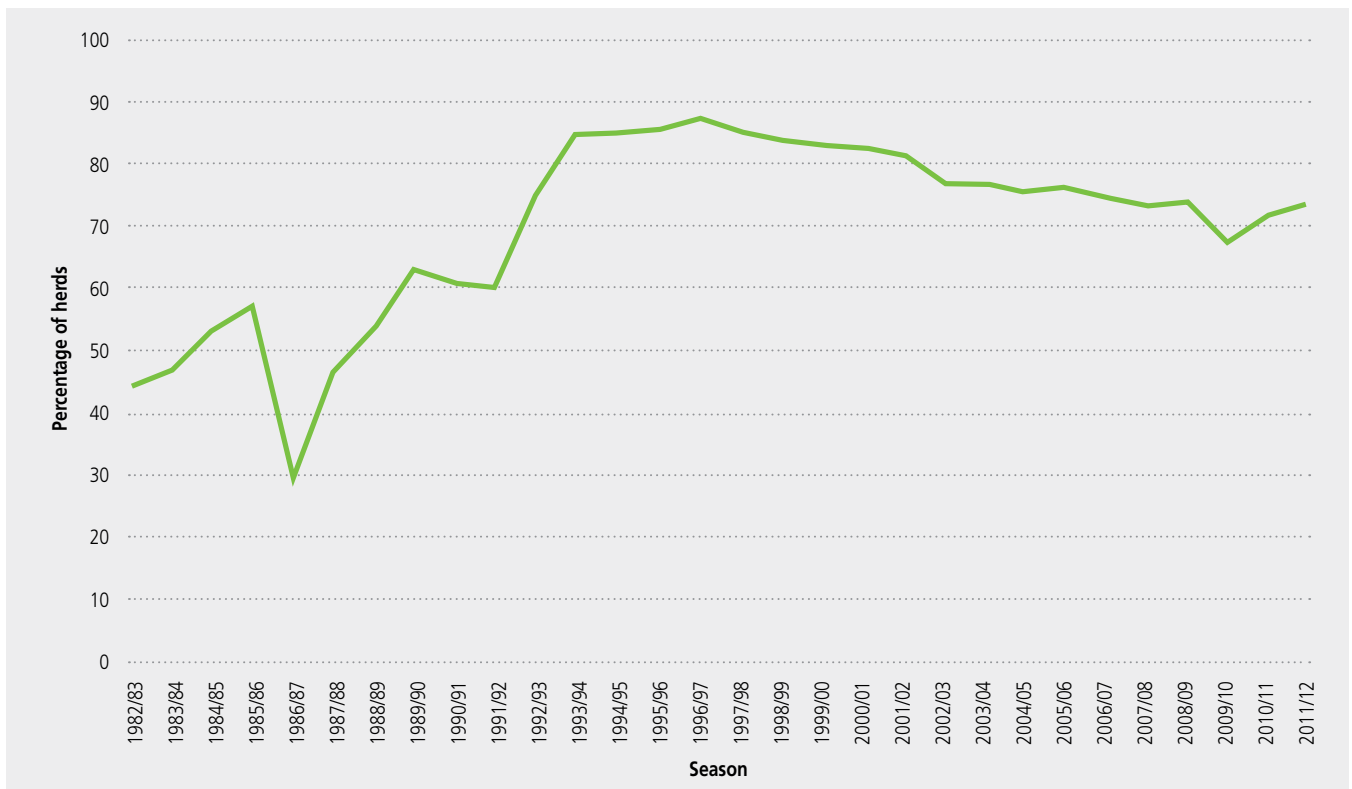
The percentage of total herds and the percentage of total cows using herd testing continues to increase (73.5% and 72.6% respectively for 2011/12, Table 4.1). Herd testing in 2009/10 was unusually low, probably as a result of an expected low milk price at the start of the 2009/10 season. A record 3.36 million cows were herd-tested in 2011/12.

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

Season	Number of herds herd-tested	% of total herds	Number of cows herd-tested (000)	% of total cows	Total herds	Total cows (000)
1992/93	10,843	75.0	2,039	78.3	14,458	2,603
1993/94	12,372	84.8	2,377	86.9	14,597	2,736
1994/95	12,446	85.0	2,474	87.4	14,649	2,831
1995/96	12,620	85.6	2,592	88.3	14,736	2,936
1996/97	12,851	87.2	2,746	89.6	14,741	3,065
1997/98	12,510	85.3	2,826	87.7	14,673	3,223
1998/99	12,059	84.0	2,819	85.7	14,362	3,289
1999/00	11,521	83.1	2,806	85.8	13,861	3,269
2000/01	11,472	82.6	2,942	84.4	13,892	3,486
2001/02	11,113	81.4	2,974	80.5	13,649	3,693
2002/03	10,113	77.0	2,855	76.3	13,140	3,741
2003/04	9,772	76.6	2,842	73.8	12,751	3,851
2004/05	9,306	75.8	2,811	72.7	12,271	3,868
2005/06	9,082	76.4	2,846	74.3	11,883	3,832
2006/07	8,692	74.7	2,791	71.2	11,630	3,917
2007/08	8,405	73.5	2,871	71.5	11,436	4,013
2008/09	8,589	73.9	3,040	71.5	11,618	4,253
2009/10	7,870	67.3	2,812	64.0	11,691	4,397
2010/11	8,409	71.7	3,186	70.4	11,735	4,529
2011/12	8,673	73.5	3,362	72.6	11,798	4,634

The trend in the percentage of total herds using herd testing shows an increase again after the marked decline in 2009/10 (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 2011/12 is shown in Table 4.2, where the number of cows tested refers to all cows tested at least once in the season. Next to East Coast, where eight of the nine herds were herd-tested, Taranaki had the highest percentage of herds using herd testing (81%) and the highest percentage of cows herd testing (81%). The Central Plateau recorded the lowest percentage of cows herd tested (58%). In general, the growth areas of North and South Canterbury and Southland have low percentages of herds that herd test.

Table 4.2: Use of herd testing by region in 2011/12

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	639	933	68.5	196,036	279,429	70.2	307	299
Auckland	318	440	72.3	81,402	109,577	74.3	256	249
Waikato	2,667	3,556	75.0	856,001	1,139,842	75.1	321	321
Bay of Plenty	449	597	75.2	145,158	191,537	75.8	323	321
Central Plateau	271	464	58.4	133,195	239,485	55.6	491	516
Western Uplands	61	84	72.6	27,684	39,180	70.7	454	466
East Coast	8	9	88.9	3,230	4,807	67.2	404	534
Hawkes Bay	56	71	78.9	37,171	46,713	79.6	664	658
Taranaki	1,401	1,731	80.9	392,618	484,204	81.1	280	280
Manawatu	411	562	73.1	160,505	212,139	75.7	391	377
Wairarapa	364	465	78.3	126,867	166,803	76.1	349	359
Nelson/Marlborough	187	237	78.9	63,127	84,423	74.8	338	356
West Coast	263	374	70.3	99,754	146,925	67.9	379	393
North Canterbury	514	724	71.0	393,232	559,490	70.3	765	773
South Canterbury	159	248	64.1	128,031	193,092	66.3	805	779
Otago	288	399	72.2	167,636	230,837	72.6	582	579
Southland	617	904	68.3	350,590	505,743	69.3	568	559
New Zealand	8,673	11,798	73.5	3,362,237	4,634,226	72.6	388	393

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 days or more 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

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

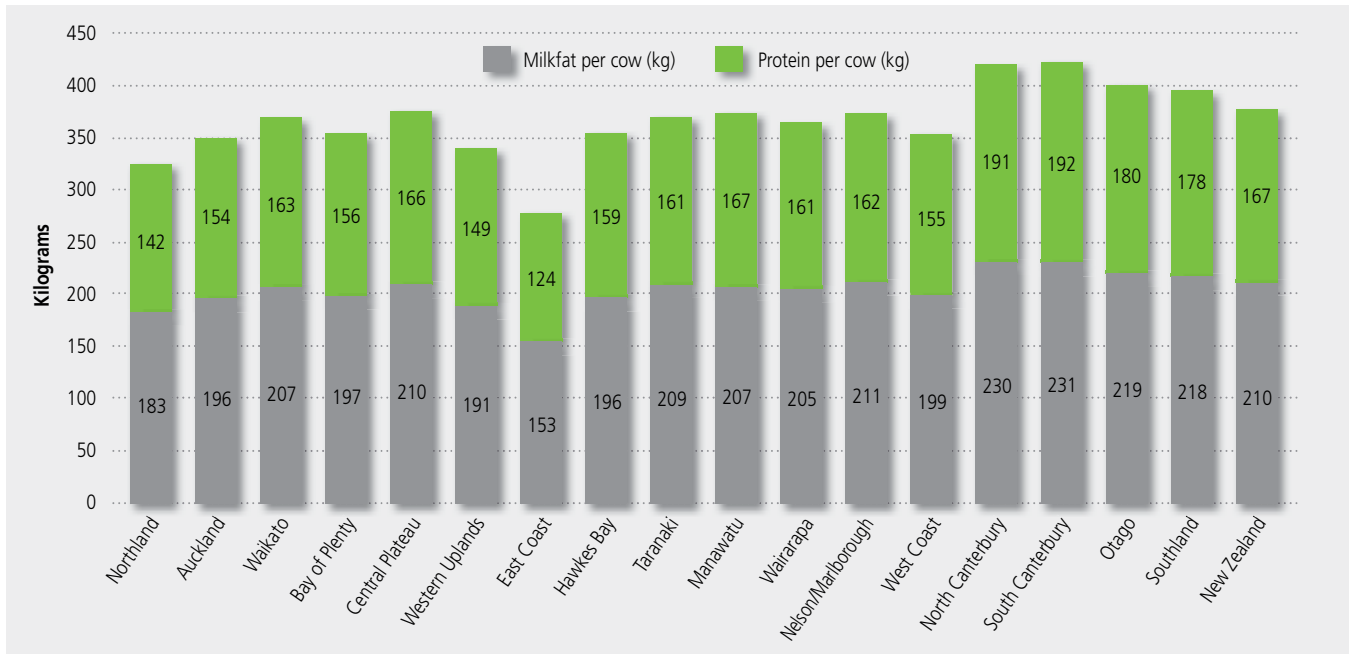
The average per-cow statistics for each region are summarised in Table 4.3. South Canterbury recorded the highest per cow milk volume (5,061 litres), milkfat (231 kg) and protein (192 kg), of cows herd tested. Taranaki recorded the highest percentage for milkfat (5.09%) and milksolids (9%), due to having a larger proportion of Jersey cows. Herds on the West Coast recorded the lowest average somatic cells (172,000 cells/ml), while herds in Hawke's Bay had the highest (270,000 cells/ml).

Table 4.3: Season herd test averages per cow by region in 2011/12

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	3,813	183	4.79	142	3.71	324	8.50	233	279	233
Auckland	4,171	196	4.69	154	3.69	350	8.38	237	284	230
Waikato	4,308	207	4.80	163	3.77	369	8.57	239	278	188
Bay of Plenty	4,205	197	4.69	156	3.70	353	8.39	229	275	196
Central Plateau	4,452	210	4.71	166	3.73	376	8.44	224	271	207
Western Uplands	3,903	191	4.89	149	3.81	339	8.69	234	272	188
East Coast	3,427	153	4.47	124	3.60	277	8.07	203	269	224
Hawkes Bay	4,233	196	4.62	159	3.75	354	8.37	234	274	270
Taranaki	4,109	209	5.09	161	3.91	370	9.00	235	270	195
Manawatu	4,513	207	4.58	167	3.69	373	8.27	236	279	230
Wairarapa	4,219	205	4.86	161	3.81	366	8.67	235	276	217
Nelson/Marlborough	4,233	211	4.97	162	3.82	372	8.80	235	271	193
West Coast	3,933	199	5.06	155	3.93	354	8.99	232	270	172
North Canterbury	4,996	230	4.61	191	3.82	421	8.43	238	277	199
South Canterbury	5,061	231	4.57	192	3.79	423	8.36	235	278	200
Otago	4,718	219	4.64	180	3.81	399	8.46	235	273	209
Southland	4,626	218	4.71	178	3.84	396	8.55	231	270	229
New Zealand	4,409	210	4.77	167	3.80	378	8.56	235	275	204

The 2011/12 milkfat and protein lactation regional averages for herd-tested cows (Graph 4.2) show some variability in figures among regions, with milkfat production ranging from 153 (East Coast) to 231 kg per cow (South Canterbury) and protein production from 124 (East Coast) to 192 kg per cow (South Canterbury).

Graph 4.2: Average milkfat and protein production per cow by region in 2011/12



- Production per cow highest in 20 seasons

The last 20 seasons have seen a general trend of increasing production in both milk volume and milksolids (Table 4.4). The herd test average milksolids per cow at 378 kg in 2011/12 was 100 kg higher than 20 seasons ago.

The average herd somatic cell count dropped to 204,000 cells/millilitre in 2011/12. Average days in milk at 275 in 2011/12 was similar to the previous season. The milksolids percentage of 8.56% was the highest on record.

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)
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
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

- 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 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.

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 at least once during the season (Table 4.5).

Table 4.5: Monthly herd test averages by region in 2011/12

Average litres of milk per cow per day

Farming region	2011							2012					Season average
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
Northland	16.54	14.63	18.56	20.03	19.12	16.77	15.15	14.78	12.82	11.02	10.93	14.54	15.54
Auckland	17.29	15.48	18.98	20.78	20.00	17.96	16.28	15.52	13.82	12.99	12.02	15.22	16.66
Waikato	16.91	17.31	20.96	22.36	21.93	19.42	17.54	16.37	14.34	12.89	12.14	12.17	17.45
Bay of Plenty	5.93	14.69	21.25	22.50	22.00	19.78	17.62	16.06	14.56	12.99	12.24	14.87	17.66
Central Plateau	10.05	.	22.08	23.98	24.39	21.95	19.94	18.16	16.44	14.31	13.29	12.67	19.20
Western Uplands	.	.	22.87	21.77	20.97	19.74	16.84	15.51	13.64	11.55	10.97	9.80	16.06
East Coast	12.78	.	.	16.53	22.61	17.21	18.41	12.02	15.75	.	9.64	.	16.46
Hawkes Bay	17.98	17.34	24.39	21.61	21.89	19.46	17.44	15.88	14.74	12.63	10.87	13.76	17.24
Taranki	17.91	16.95	20.37	21.58	21.31	18.59	17.43	15.77	14.77	12.33	11.82	10.61	16.91
Manawatu	17.04	17.55	18.97	23.57	23.28	20.33	19.07	16.58	15.64	13.98	12.66	13.06	18.40
Wairarapa	13.71	16.46	16.20	21.95	22.26	20.05	17.66	16.04	15.33	12.97	12.16	11.33	17.34
Nelson/Marlborough	19.98	.	17.10	23.44	22.41	20.22	18.14	16.69	15.01	12.12	11.84	12.28	17.49
West Coast	.	.	.	20.95	21.79	19.14	17.21	15.29	14.53	12.31	12.15	9.12	16.69
North Canterbury	18.12	20.24	20.03	24.09	25.33	22.85	22.10	19.63	18.19	16.23	14.45	14.18	20.43
South Canterbury	20.54	21.70	24.16	25.13	25.58	24.14	21.52	20.21	18.33	16.24	14.78	13.83	20.45
Otago	13.77	17.17	10.81	24.28	24.58	22.31	20.55	18.44	17.30	15.06	14.20	14.22	19.53
Southland	19.62	19.15	20.41	23.25	24.65	22.48	20.48	16.64	17.60	15.38	14.55	13.69	19.36
New Zealand¹	16.95	17.30	20.45	22.50	22.93	20.27	18.77	16.84	15.62	13.67	12.91	12.95	18.10

Average kg of milkfat per cow per day

Farming region	2011							2012					Season average
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
Northland	0.78	0.72	0.85	0.94	0.88	0.81	0.73	0.74	0.66	0.63	0.63	0.76	0.78
Auckland	0.77	0.72	0.84	0.93	0.91	0.84	0.78	0.75	0.70	0.71	0.67	0.81	0.81
Waikato	0.82	0.84	0.97	1.03	1.02	0.92	0.86	0.82	0.76	0.73	0.70	0.71	0.88
Bay of Plenty	0.35	0.68	0.96	1.03	0.99	0.91	0.84	0.77	0.75	0.72	0.68	0.78	0.86
Central Plateau	0.55	.	1.06	1.10	1.09	1.00	0.93	0.88	0.82	0.79	0.74	0.73	0.94
Western Uplands	.	.	0.87	0.98	0.99	0.94	0.81	0.77	0.72	0.66	0.65	0.62	0.83
East Coast	0.59	.	.	0.72	0.94	0.74	0.80	0.60	0.78	.	0.52	.	0.76
Hawkes Bay	0.86	0.77	1.00	0.97	0.97	0.90	0.82	0.77	0.74	0.67	0.63	0.71	0.84
Taranki	0.89	0.90	0.95	1.04	1.03	0.94	0.89	0.85	0.81	0.75	0.71	0.67	0.9
Manawatu	0.81	0.82	0.86	1.04	1.03	0.93	0.88	0.79	0.78	0.73	0.68	0.73	0.88
Wairarapa	0.72	0.80	0.77	1.01	1.03	0.97	0.86	0.82	0.81	0.74	0.69	0.67	0.88
Nelson/Marlborough	0.95	.	0.86	1.09	1.08	0.98	0.90	0.85	0.80	0.71	0.72	0.73	0.91
West Coast	.	.	.	0.97	1.02	0.95	0.87	0.81	0.79	0.72	0.74	0.64	0.88
North Canterbury	0.84	0.89	0.93	1.08	1.13	1.02	1.01	0.92	0.90	0.85	0.79	0.78	0.98
South Canterbury	0.93	0.95	1.10	1.12	1.14	1.08	0.97	0.95	0.90	0.85	0.81	0.78	0.98
Otago	0.70	0.81	0.54	1.10	1.07	1.01	0.94	0.88	0.87	0.80	0.78	0.82	0.94
Southland	0.89	0.98	1.04	1.07	1.09	1.04	0.95	0.84	0.89	0.83	0.80	0.77	0.95
New Zealand¹	0.80	0.82	0.94	1.04	1.05	0.96	0.90	0.84	0.81	0.76	0.73	0.75	0.90

Average kg of protein per cow per day

Farming region	2011 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2012 Jan	Feb	Mar	Apr	May	Season average
Northland	0.61	0.55	0.69	0.75	0.71	0.63	0.55	0.56	0.49	0.46	0.48	0.60	0.6
Auckland	0.63	0.56	0.68	0.76	0.74	0.67	0.60	0.58	0.53	0.54	0.52	0.62	0.63
Waikato	0.65	0.67	0.79	0.84	0.82	0.73	0.66	0.62	0.56	0.54	0.53	0.55	0.68
Bay of Plenty	0.25	0.54	0.78	0.84	0.81	0.73	0.64	0.59	0.55	0.54	0.53	0.63	0.67
Central Plateau	0.43	.	0.81	0.89	0.89	0.80	0.73	0.68	0.63	0.59	0.58	0.57	0.73
Western Uplands	.	.	0.80	0.82	0.79	0.73	0.63	0.58	0.54	0.48	0.48	0.46	0.63
East Coast	0.48	.	.	0.59	0.81	0.61	0.65	0.44	0.58	.	0.41	.	0.61
Hawkes Bay	0.68	0.63	0.85	0.82	0.80	0.72	0.65	0.60	0.58	0.52	0.48	0.58	0.67
Taranki	0.69	0.66	0.75	0.82	0.82	0.73	0.68	0.63	0.60	0.54	0.53	0.49	0.68
Manawatu	0.65	0.67	0.71	0.87	0.86	0.74	0.70	0.62	0.60	0.57	0.54	0.56	0.7
Wairarapa	0.57	0.63	0.66	0.83	0.84	0.75	0.66	0.62	0.61	0.55	0.53	0.51	0.68
Nelson/Marlborough	0.72	.	0.65	0.88	0.85	0.75	0.68	0.64	0.59	0.52	0.54	0.57	0.69
West Coast	.	.	.	0.80	0.83	0.73	0.66	0.60	0.59	0.54	0.56	0.45	0.67
North Canterbury	0.69	0.74	0.74	0.90	0.94	0.85	0.82	0.75	0.73	0.69	0.64	0.64	0.8
South Canterbury	0.77	0.86	0.89	0.93	0.95	0.89	0.80	0.77	0.73	0.69	0.65	0.62	0.8
Otago	0.57	0.62	0.39	0.90	0.90	0.83	0.77	0.70	0.69	0.64	0.63	0.66	0.77
Southland	0.77	0.76	0.81	0.86	0.92	0.84	0.77	0.64	0.71	0.66	0.65	0.62	0.76
New Zealand¹	0.64	0.66	0.76	0.84	0.86	0.76	0.70	0.64	0.62	0.58	0.57	0.58	0.71

Average somatic cell count (000 cells per millilitre)

Farming region	2011 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2012 Jan	Feb	Mar	Apr	May	Season average
Northland	266	281	223	182	201	188	233	236	262	284	309	278	233
Auckland	247	325	219	203	213	190	207	236	264	245	296	261	230
Waikato	272	248	199	169	161	152	169	189	209	221	243	261	188
Bay of Plenty	322	264	207	171	176	158	181	204	212	241	251	273	196
Central Plateau	1107	.	156	178	183	182	204	199	216	237	262	279	207
Western Uplands	.	.	76	157	150	145	171	183	208	218	259	259	188
East Coast	408	.	.	230	155	201	169	225	231	.	358	.	224
Hawkes Bay	290	299	172	257	254	229	204	276	276	309	329	324	270
Taranki	276	283	247	169	175	165	189	189	209	237	242	248	195
Manawatu	283	286	253	206	203	207	215	243	232	244	284	297	230
Wairarapa	246	302	221	202	189	187	200	212	230	247	268	272	217
Nelson/Marlborough	334	.	329	164	178	173	163	196	204	243	218	241	193
West Coast	.	.	.	133	141	164	150	188	185	205	209	255	172
North Canterbury	279	295	244	212	204	190	203	190	195	182	212	222	199
South Canterbury	307	246	339	215	203	184	198	206	196	194	196	218	200
Otago	230	305	581	230	199	214	191	224	194	214	216	209	209
Southland	385	348	342	242	225	219	218	254	230	228	214	240	229
New Zealand¹	274	288	212	187	188	179	192	208	214	227	239	250	204

¹ Volume weighted averages

iii) Breed averages

- *Holstein-Friesian and Cross-bred 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 cows produced a higher volume of milk and more protein (kg) than other breeds, while Holstein-Friesian/Jersey crossbreed cows produced more milkfat (kg). Jerseys have the highest milkfat and protein percentages. For all four breeds in table 4.6, six-year-old cows produced more milksolids (kg) than any other age group.

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 2011/12

Holstein-Friesian

Age	Cows tested	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	169,157	230	3,740	165.1	137.2	302.3	4.47	3.68	8.15
3	176,449	224	4,363	193.5	161.2	354.7	4.50	3.71	8.21
4	153,859	223	4,799	212.1	176.2	388.3	4.48	3.69	8.17
5	126,936	223	5,011	216.3	182.3	398.6	4.37	3.65	8.02
6	108,500	222	5,062	219.9	184.6	404.5	4.39	3.66	8.05
7	78,594	220	4,962	216.6	179.9	396.5	4.41	3.64	8.05
8	57,669	219	4,832	210.6	174.2	384.8	4.40	3.62	8.02
9	42,276	215	4,617	204.4	165.7	370.1	4.47	3.60	8.07
10+	55,389	211	4,288	190.1	152.5	342.6	4.47	3.57	8.04
Total	968,829	223	4,570	200.6	166.8	367.4	4.44	3.67	8.11

Jersey

Age	Cows tested	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	63,352	231	2,742	154.8	112.1	267.0	5.68	4.10	9.78
3	61,279	227	3,166	181.5	132.4	313.9	5.78	4.19	9.97
4	54,676	227	3,432	198.8	144.2	343.0	5.83	4.22	10.05
5	45,895	227	3,547	205.1	149.4	354.5	5.82	4.23	10.05
6	40,255	225	3,559	205.7	149.4	355.1	5.81	4.21	10.02
7	29,468	224	3,528	201.3	146.6	348.0	5.74	4.17	9.91
8	22,542	223	3,394	194.0	141.2	335.1	5.75	4.18	9.93
9	15,312	219	3,260	187.0	134.5	321.5	5.77	4.14	9.91
10+	21,114	215	3,075	174.7	125.5	300.1	5.71	4.10	9.81
Total	353,893	226	3,269	187.5	136.2	323.6	5.77	4.18	9.95

Holstein-Friesian/Jersey crossbreed

Age	Cows tested	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	267,040	231	3,386	167.6	131.5	299.1	5.01	3.90	8.91
3	229,572	227	3,958	196.9	155.7	352.6	5.04	3.95	8.99
4	186,538	226	4,312	215.8	169.1	384.9	5.07	3.94	9.01
5	140,456	227	4,524	222.8	176.3	399.1	4.98	3.92	8.90
6	114,384	225	4,569	225.4	177.7	403.1	4.99	3.91	8.90
7	81,299	224	4,528	222.9	174.6	397.5	4.97	3.88	8.85
8	61,367	222	4,408	216.7	169.6	386.3	4.97	3.87	8.84
9	41,020	219	4,239	210.6	162.2	372.8	5.02	3.84	8.86
10+	53,577	215	3,921	195.7	148.8	344.5	5.03	3.81	8.84
Total	1,175,253	226	4,082	202.4	158.9	361.2	5.01	3.91	8.92

Ayrshire

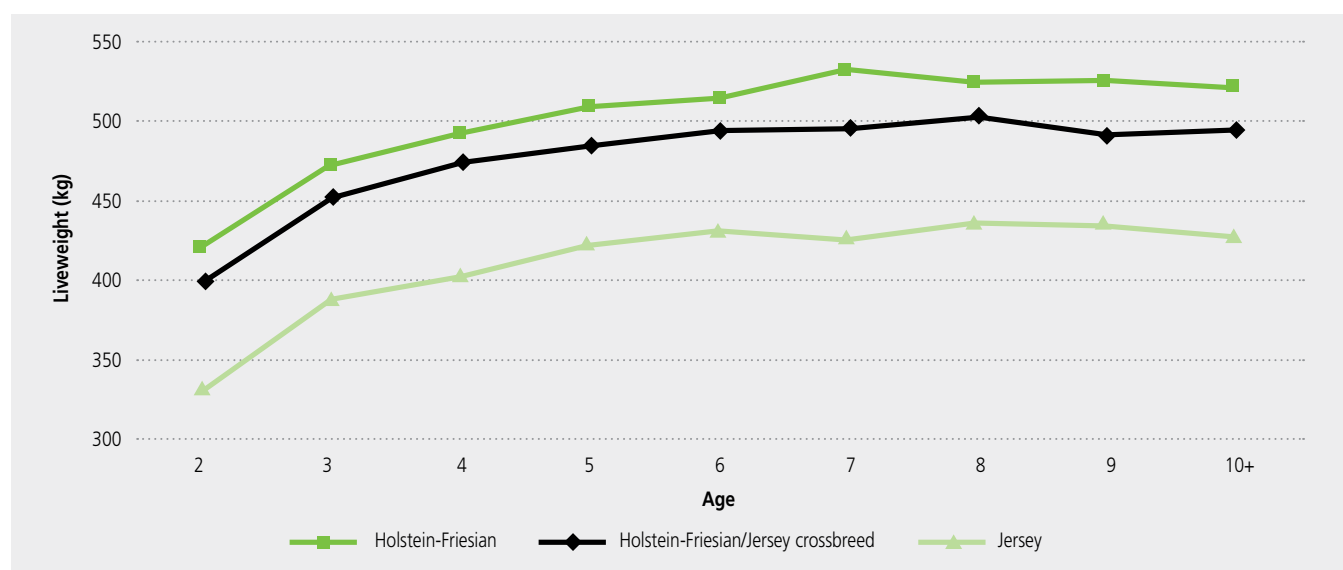
Age	Cows tested	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	3,154	235	3,315	148.3	119.4	267.7	4.50	3.61	8.11
3	2,921	232	3,930	175.0	143.7	318.7	4.49	3.67	8.16
4	2,603	231	4,252	188.8	155.2	344.0	4.47	3.66	8.13
5	2,365	231	4,377	192.7	159.3	352.0	4.43	3.65	8.08
6	2,116	229	4,409	194.5	160.7	355.3	4.44	3.66	8.10
7	1,604	229	4,371	191.2	158.5	349.6	4.40	3.64	8.04
8	1,236	225	4,292	189.3	155.0	344.3	4.44	3.62	8.06
9	984	223	4,172	182.9	150.4	333.3	4.41	3.62	8.03
10+	1,385	220	3,905	170.6	140.1	310.7	4.39	3.59	7.98
Total	18,368	230	4,057	179.4	147.3	326.6	4.45	3.64	8.09

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 at all ages. Liveweight by age and breed is illustrated in Graph 4.3.

Table 4.7: Liveweight by age and breed of cow in 2011/12

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	420	6,171	332	2,925	398	9,979
3	473	2,166	388	713	451	3,050
4	491	1,843	402	596	474	2,364
5	509	1,334	422	458	484	1,825
6	515	1,300	431	449	494	1,439
7	532	793	425	340	496	890
8	525	524	435	223	502	681
9	526	362	434	143	489	448
10+	522	424	426	195	494	532
Total	489		400		460	

Graph 4.3: Liveweight by age and breed of cow in 2011/12



C. Artificial Breeding (AB) statistics

• 3.4 million cows to AB in 2011/12

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. The percentage of cows to AB has fluctuated between 72% (2009/10) and 76% (2007/08) for the last nine seasons (Graph 4.4). The number of cows to AB increased 4.3% to a record 3.4 million in 2011/12. The number of yearlings to AB increased to 177,000 from 148,500 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	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Northland	188,121	182,339	176,370	172,786	175,082	171,472	168,427	171,390	180,615
Auckland	88,658	86,109	81,693	75,613	75,624	73,708	70,604	70,730	73,516
Waikato	828,009	831,809	802,112	810,022	831,945	816,985	803,113	817,660	837,380
Bay of Plenty	145,855	141,484	141,621	143,911	146,265	142,908	135,087	138,554	136,183
Central Plateau	122,990	120,001	116,980	121,672	127,817	129,853	128,561	132,040	143,101
Western Uplands	17,533	18,337	17,370	19,455	20,522	21,781	20,508	25,415	25,136
East Coast	1,091	612	686	514	1,466	3,163	1,343	714	1,474
Hawkes Bay	22,047	22,469	23,896	25,703	27,561	29,426	28,480	32,338	34,433
Taranaki	398,026	388,247	380,806	371,923	390,732	381,876	379,318	389,668	392,236
Manawatu	139,932	137,124	140,106	138,647	140,265	138,830	131,907	141,879	151,327
Wairarapa	121,406	120,794	124,159	121,840	126,863	129,383	124,670	128,243	133,934
Nelson/Marlborough	68,303	67,261	67,119	65,909	65,512	67,270	64,028	67,256	68,986
West Coast	87,566	91,417	94,924	98,435	99,874	103,470	98,785	96,423	96,049
North Canterbury	235,999	247,379	261,166	278,983	313,423	365,250	374,378	411,344	455,981
South Canterbury	77,643	77,693	82,519	91,096	102,486	128,466	130,043	141,565	154,917
Otago	118,463	119,109	122,572	128,254	140,696	147,975	158,855	170,412	175,922
Southland	235,526	228,930	229,360	239,914	268,036	315,849	334,520	366,399	381,678
New Zealand	2,897,168	2,881,114	2,863,459	2,904,677	3,054,169	3,167,665	3,152,627	3,302,030	3,442,868

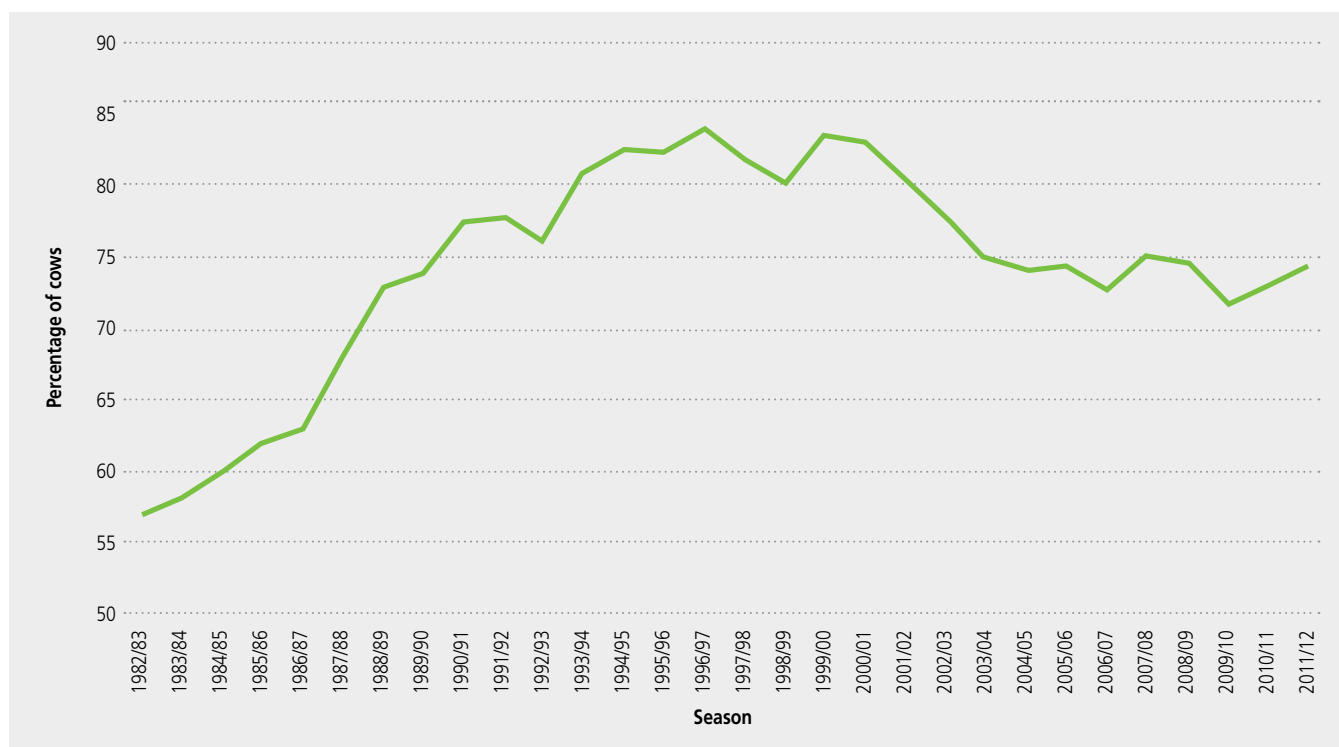
% Cows to AB

Region	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Northland	64.4	64.0	65.8	65.0	66.2	64.0	62.0	62.3	64.6
Auckland	65.8	67.4	68.6	65.0	66.9	64.9	64.5	63.9	67.1
Waikato	75.8	76.5	74.6	74.8	77.2	74.0	71.7	72.0	73.5
Bay of Plenty	76.3	75.0	75.9	75.5	76.4	73.9	70.0	72.1	71.1
Central Plateau	60.4	58.5	58.1	58.7	59.7	58.2	55.3	55.8	59.8
Western Uplands	65.4	64.1	61.3	63.9	64.1	63.8	55.5	63.9	64.2
East Coast	25.9	12.1	11.9	12.2	37.7	76.7	24.1	15.1	30.7
Hawkes Bay	62.5	62.5	66.9	68.9	74.7	67.8	62.0	69.3	73.7
Taranaki	80.6	78.8	79.1	77.6	82.3	80.3	79.3	80.0	81.0
Manawatu	74.0	73.1	77.9	73.2	73.7	70.2	65.0	66.6	71.3
Wairarapa	75.0	75.3	79.5	76.7	80.0	78.4	75.6	77.9	80.3
Nelson/Marlborough	79.9	79.0	80.1	81.1	80.8	82.3	77.0	79.3	81.7
West Coast	75.8	73.9	76.6	77.2	75.3	74.0	68.8	66.4	65.4
North Canterbury	82.8	81.3	80.3	80.0	81.0	82.1	78.8	80.4	81.5
South Canterbury	84.6	79.4	77.2	76.9	78.4	78.3	73.9	76.8	80.2
Otago	80.7	78.2	80.1	79.7	82.5	81.1	79.9	80.1	76.2
Southland	78.3	76.3	75.8	75.3	75.9	75.5	73.0	75.7	75.5
New Zealand	75.2	74.5	74.7	74.2	76.1	74.5	71.7	72.9	74.3

Yearlings to AB

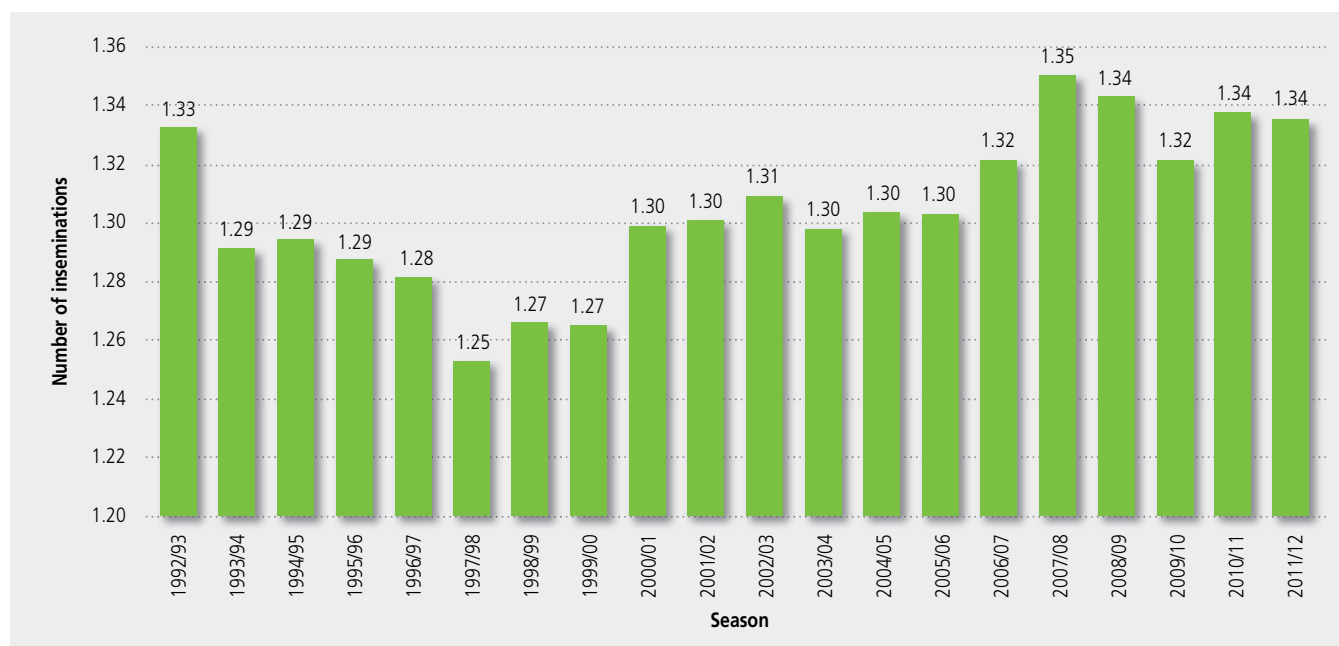
Region	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Northland	6,897	6,333	7,334	8,533	11,759	10,796	8,816	8,744	9,637
Auckland	1,900	2,075	2,420	2,338	3,454	3,336	2,588	3,073	3,170
Waikato	13,893	13,933	13,312	16,126	22,341	22,557	15,505	18,676	23,609
Bay of Plenty	4,711	5,027	6,696	7,723	11,508	10,495	7,116	7,871	7,461
Central Plateau	1,849	1,862	2,008	3,374	4,811	3,944	2,917	2,704	4,118
Western Uplands	616	637	655	550	1,141	853	782	1,048	1,577
East Coast	43	0	0	0	29	3	7	2	0
Hawkes Bay	694	872	968	1,042	1,417	2,037	1,010	1,986	2,025
Taranaki	3,692	3,268	3,375	3,420	8,227	6,775	4,822	5,191	6,458
Manawatu	2,211	2,690	3,553	3,205	6,423	6,215	4,137	4,717	6,341
Wairarapa	2,260	2,409	2,850	3,357	5,091	5,044	4,150	4,055	4,537
Nelson/Marlborough	2,142	2,175	3,088	3,522	5,096	4,651	2,499	4,006	4,826
West Coast	1,794	1,739	1,747	1,981	3,658	4,265	3,580	3,706	4,481
North Canterbury	10,177	11,085	16,653	17,920	32,205	25,831	18,911	29,168	36,916
South Canterbury	6,971	7,096	9,193	9,750	14,020	14,669	11,395	14,808	18,151
Otago	5,903	6,545	8,201	10,225	14,767	13,599	13,043	15,754	16,392
Southland	12,606	11,535	14,302	25,160	25,358	25,210	18,209	22,947	27,266
New Zealand	78,359	79,281	96,355	118,226	171,305	160,280	119,487	148,456	176,965

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



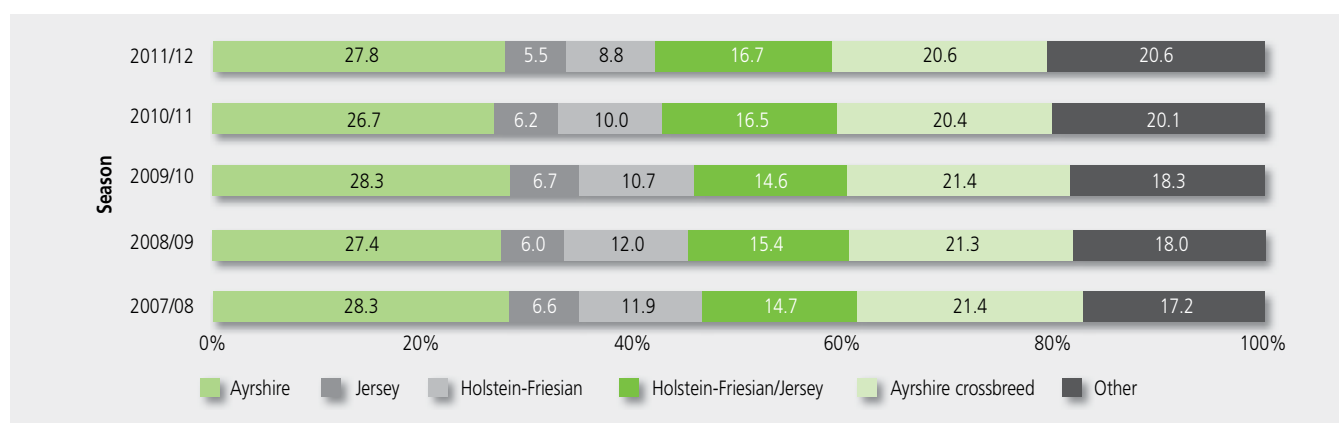
In 2011/12 the average number of inseminations per cow (1.34) (recorded on the LIC National Database) has remained the same as the previous season.

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

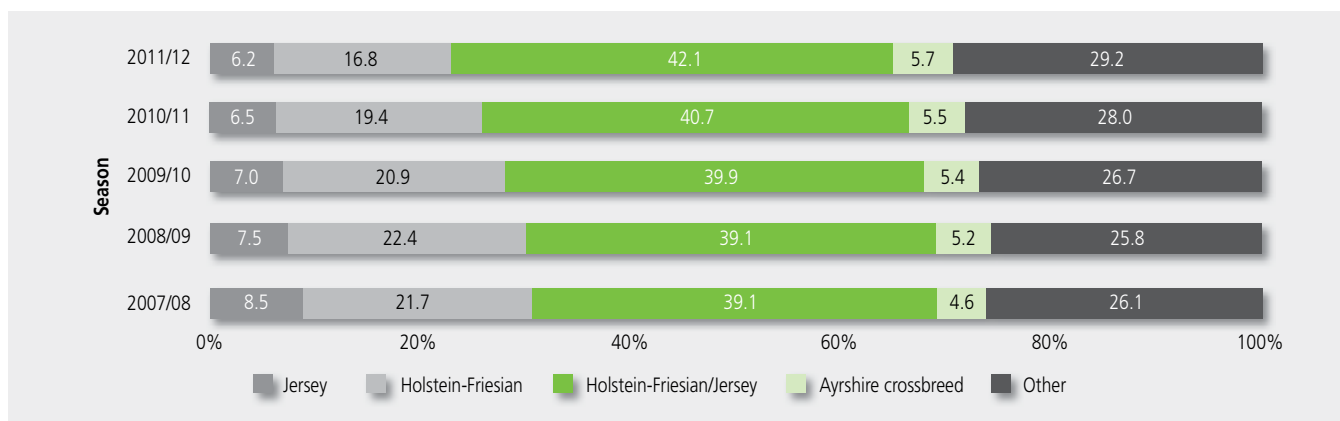


The use of Ayrshire, Holstein-Friesian and Jersey semen over different cow breeds for the past five seasons is shown in the graphs below. Ayrshire semen use over Ayrshire cows is 27.8% (Graph 4.6). Crossbreed semen is used predominantly over Friesian/Jersey crosses (Graph 4.7). The use of Jersey semen over other breeds is illustrated in Graph 4.8. The percentage of Holstein-Friesian semen over Holstein-Friesian cows continues to decrease (Graph 4.9).

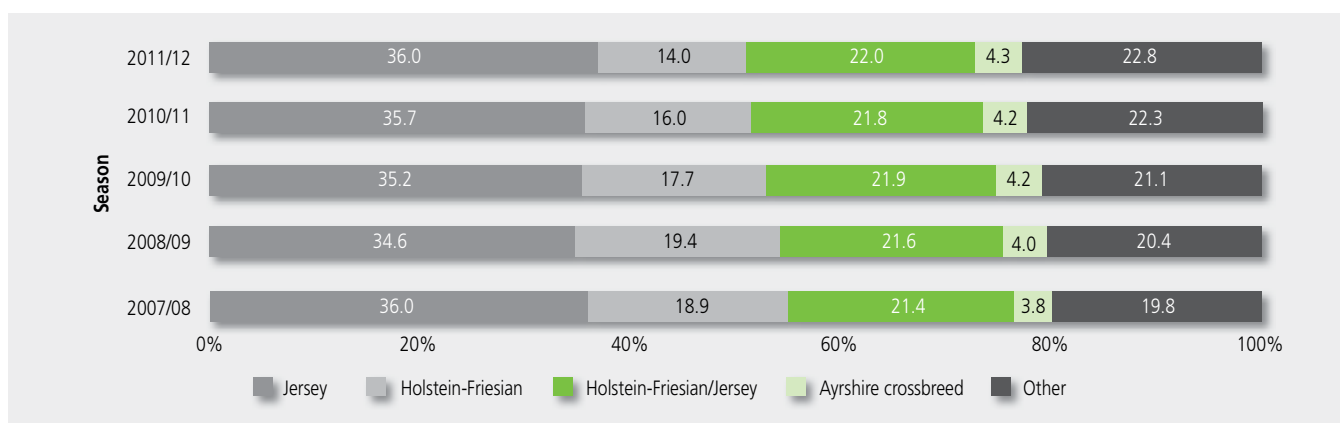
Graph 4.6: Ayrshire semen usage (%) over cow breed for the last five seasons



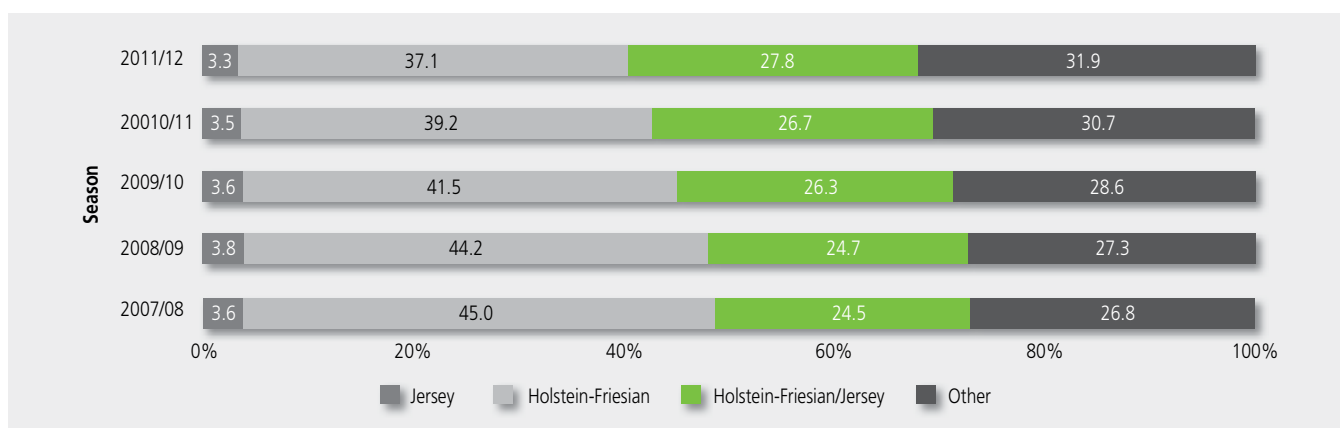
Graph 4.7: Crossbreed semen usage (%) over cow breed for the last five seasons



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

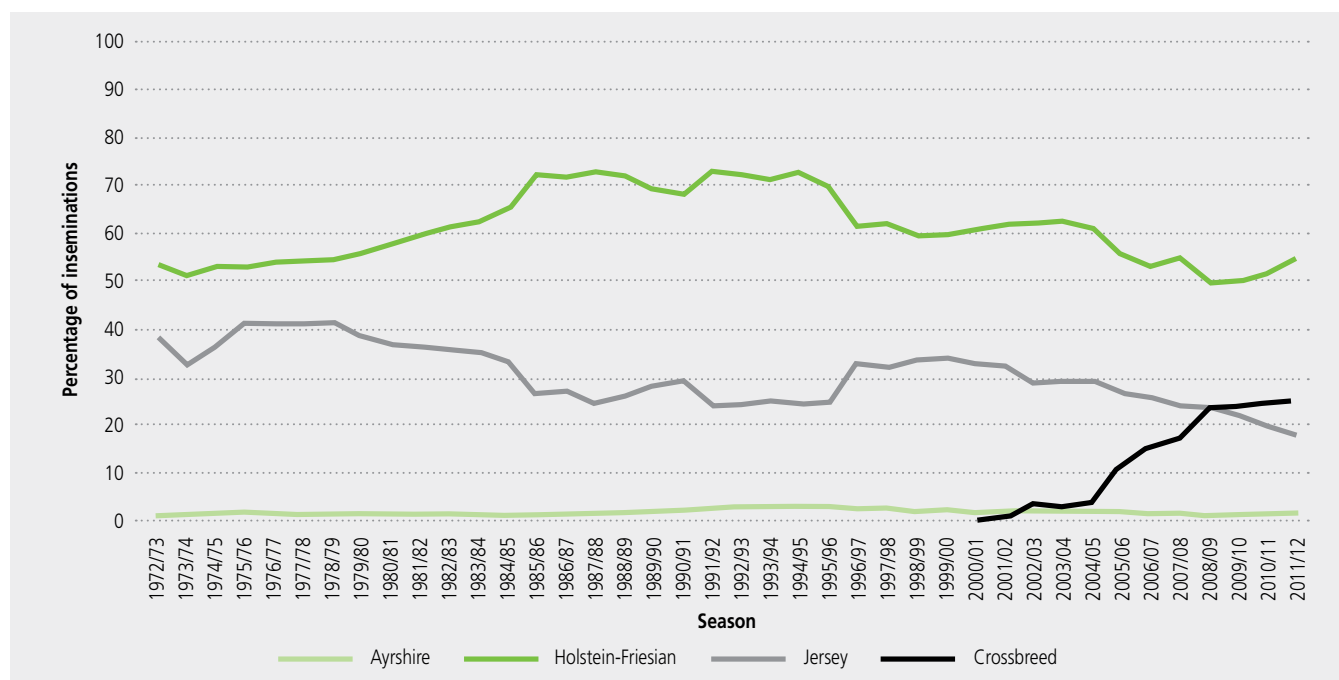


Graph 4.9: Holstein-Friesian semen usage (%) over cow breed for the last five seasons



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 to 54%, while inseminations for the Jersey breed continues to decline (now at 18%). The percentage of inseminations for crossbreed (shown since 2000/01) held steady at 24%.

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:

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

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 2012 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 11 February 2012

	Milkfat (\$/kg)	Protein (\$/kg)	Milk (\$/kg)	Liveweight (\$/kg)	Somatic Cell (\$/score)	Fertility (\$/%)	Residual Survival (\$/day)
Breeding Worth	1.920	8.685	-0.094	-1.480	-31.460	3.118	0.048
Production Worth	1.675	7.577	-0.082	-1.291	-	-	-

The information for all Animal Evaluation statistics was sourced from cows and sires recorded on the LIC National Database as at 12 May 2012. The evaluations were conducted with reference to a genetic base of cows born in 2000.

Table 4.10 shows the Breeding Values (BV) and Breeding Worth (BW) by breed, of all bulls born in 2007 first proven in the 2011/12 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 a very large number of performance-recorded daughters.

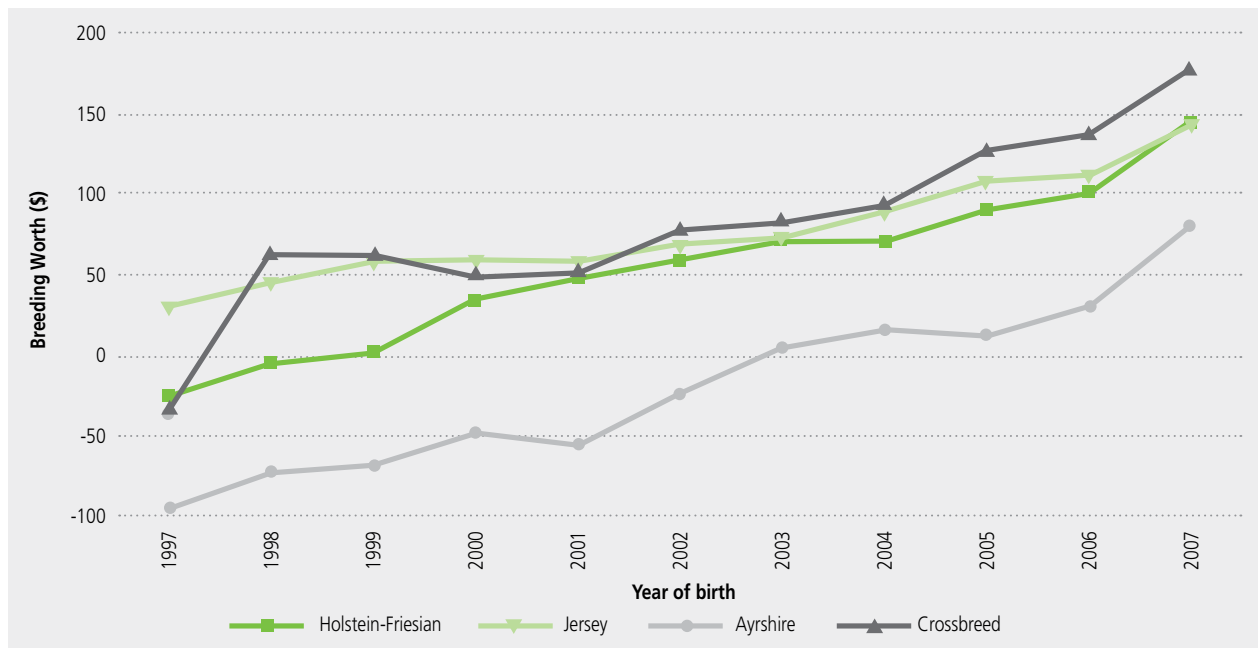
Table 4.10: Average Breeding Values and Breeding Worth of 2007 born bulls (reliability of 75% or greater)

Breed	Milkfat BV	Protein BV	Milk Volume BV	Liveweight BV	Somatic Cell BV	Fertility BV	Residual Survival BV	BW	Number of Bulls
Ayrshire	5.2	12.5	425.3	1.8	-0.2	-4.1	224.9	80.7	8
Holstein Friesian	21.4	28.6	801.4	43.3	0.1	-0.1	6.0	146.9	110
Jersey	12.6	-0.3	-443.8	-48.8	0.0	2.7	4.4	144.5	85
Holstein Friesian Jersey Cross	20.7	14.6	158.5	-13.8	0.0	2.4	-38.2	178.1	35

(Evaluation date: 12 May 2012)

The genetic trend of proven dairy bulls is shown in Graph 4.11. Bulls born in 2007 are first proven in the 2011/12 season.

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



(Evaluation date: 12 May 2012)

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 Cross	Ayrshire	Other Breeds
1997	452	283	130	3	29	7
1998	469	273	154	6	32	4
1999	471	256	144	23	41	7
2000	544	290	137	69	41	7
2001	535	260	160	74	33	8
2002	525	266	159	73	24	3
2003	508	254	145	69	38	2
2004	506	246	143	91	25	1
2005	484	219	151	94	17	3
2006	477	222	151	82	20	2
2007	238	110	85	35	8	0

(Evaluation date: 12 May 2012)

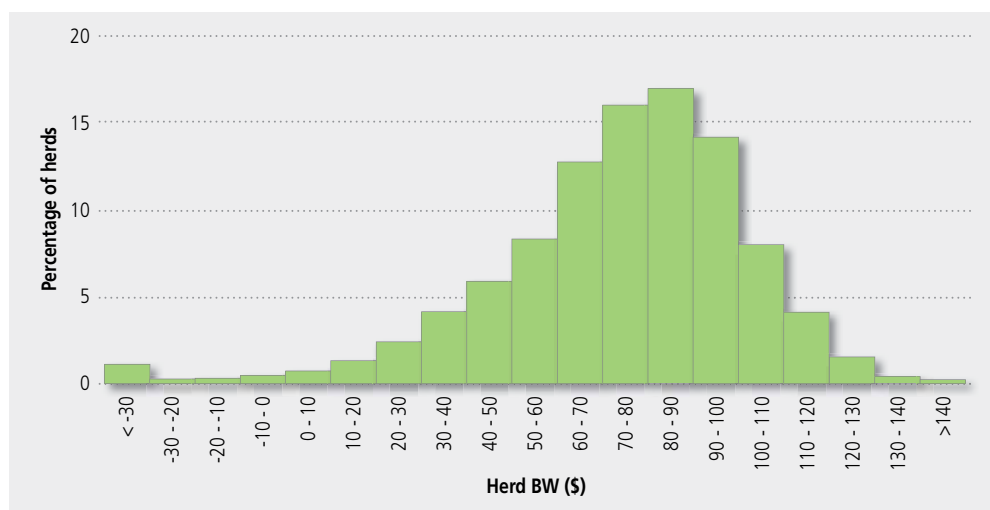
The Breeding Worth for **herds** presented below (Table 4.12 and Graph 4.12) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2011/12 season. Table 4.12 shows that 50% of these herds had a BW of 77 or above and 25% of these herds had a BW of 92 or above.

Table 4.12: Herd Breeding Worth in 2011/12

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Herd BW	77	> 113	> 105	> 92	< 59	< 37	< 22

(Evaluation date: 12 May 2012)

Graph 4.12: Distribution of Herd Breeding Worth in 2011/12



(Evaluation date: 12 May 2012)

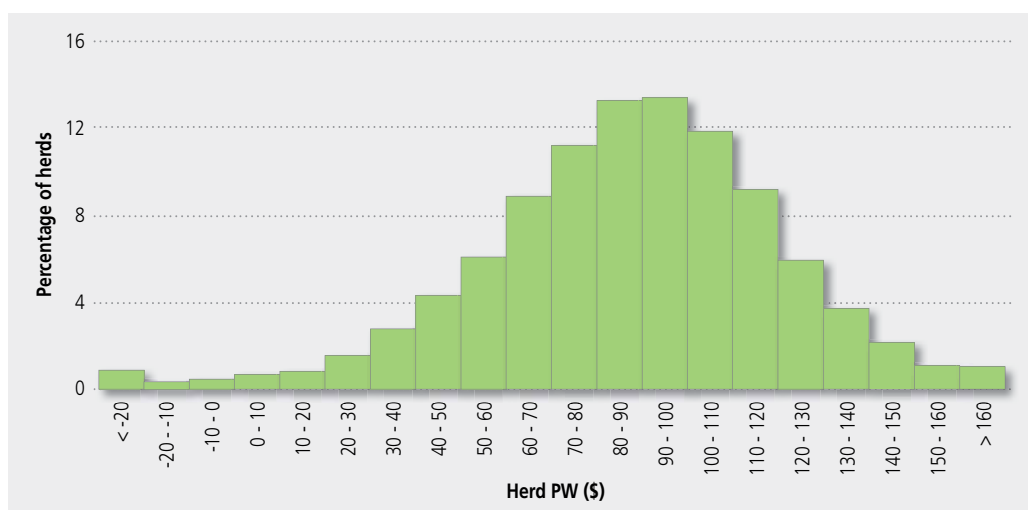
The Production Worth (PW) for **herds** presented below (Table 4.13 and Graph 4.13) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2011/12 season. Table 4.13 shows that 50% of these herds had a PW of 89 or above and 25% of these herds had a PW of 108 or above.

Table 4.13: Herd Production Worth in 2011/12

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Herd PW	89	> 137	> 126	> 108	< 68	< 43	< 31

(Evaluation date: 12 May 2012)

Graph 4.13: Distribution of Herd Production Worth in 2011/12



(Evaluation date: 12 May 2012)

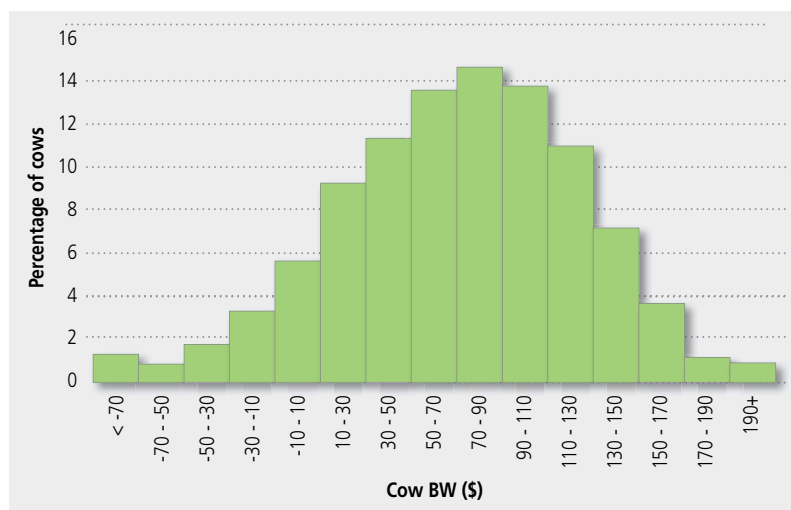
The Breeding Worth (BW) for **cows** presented below (Table 4.14 and Graph 4.14) is based on all cows of the users of herd testing services, in herds with at least 80 cows, and signed up for herd testing in the 2011/12 season. Table 4.14 shows that 50% of these cows had a BW of 74 or above and that 25% of these cows had a BW of 109 or above.

Table 4.14: Cow Breeding Worth in 2011/12

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Cow BW	74	> 154	> 137	> 109	< 35	< 0	< -23

(Evaluation date: 12 May 2012)

Graph 4.14: Distribution of Cow Breeding Worth in 2011/12



(Evaluation date: 12 May 2012)

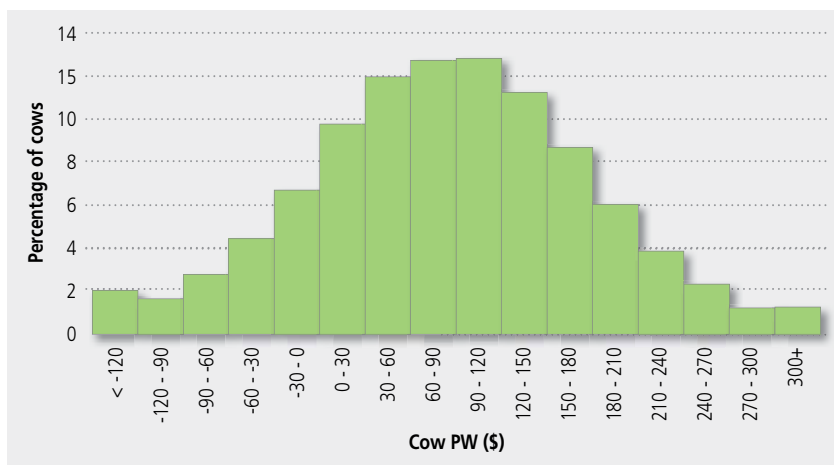
The Production Worth (PW) for **cows** presented below (Table 4.15 and Graph 4.15) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2011/12 season. Table 4.15 shows that 50% of these cows had a PW of 85 or above and that 25% of these cows had a PW of 146 or above.

Table 4.15: Cow Production Worth in 2011/12

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Cow PW	85	> 240	> 204	> 146	< 23	< -36	< -75

(Evaluation date: 12 May 2012)

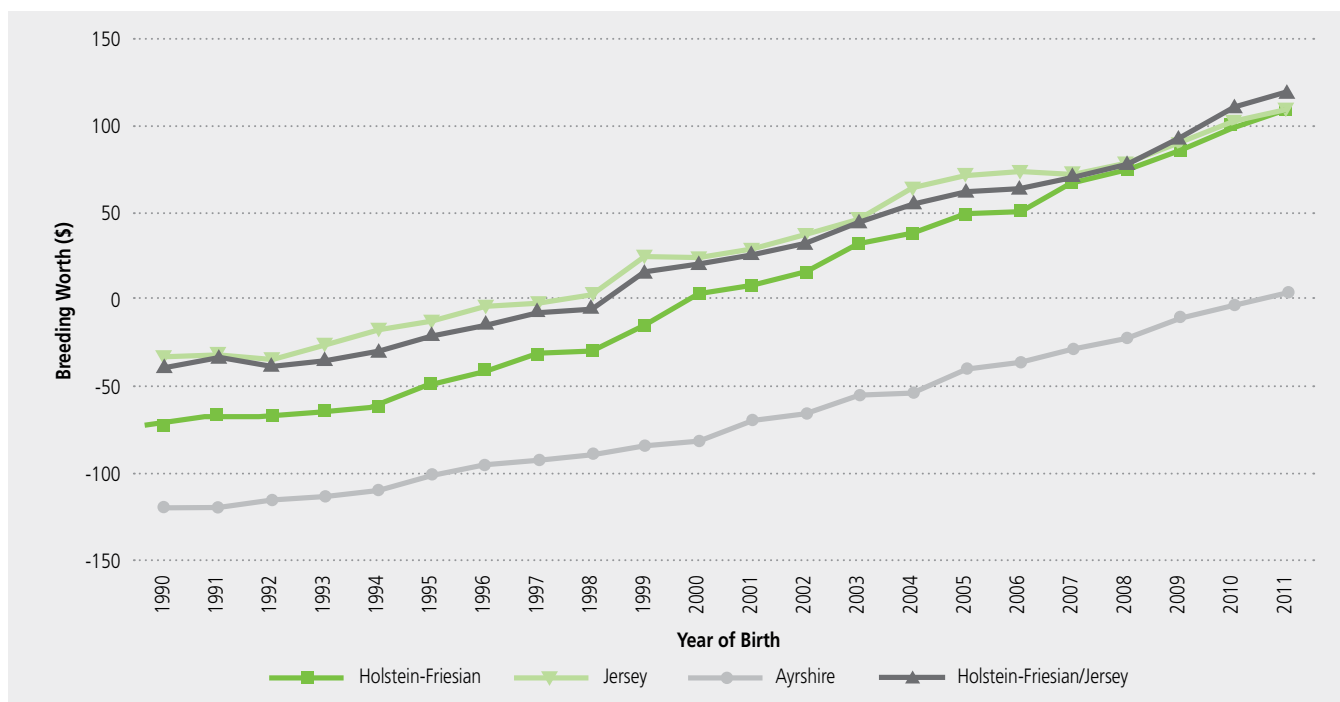
Graph 4.15: Distribution of Cow Production Worth in 2011/12



(Evaluation date: 12 May 2012)

The genetic trend for cows is based on all cows (alive or dead) recorded on the Livestock Improvement National Database in the 2011/12 season. Also included are the estimated BW and PW for replacement stock (2010 and 2011 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.

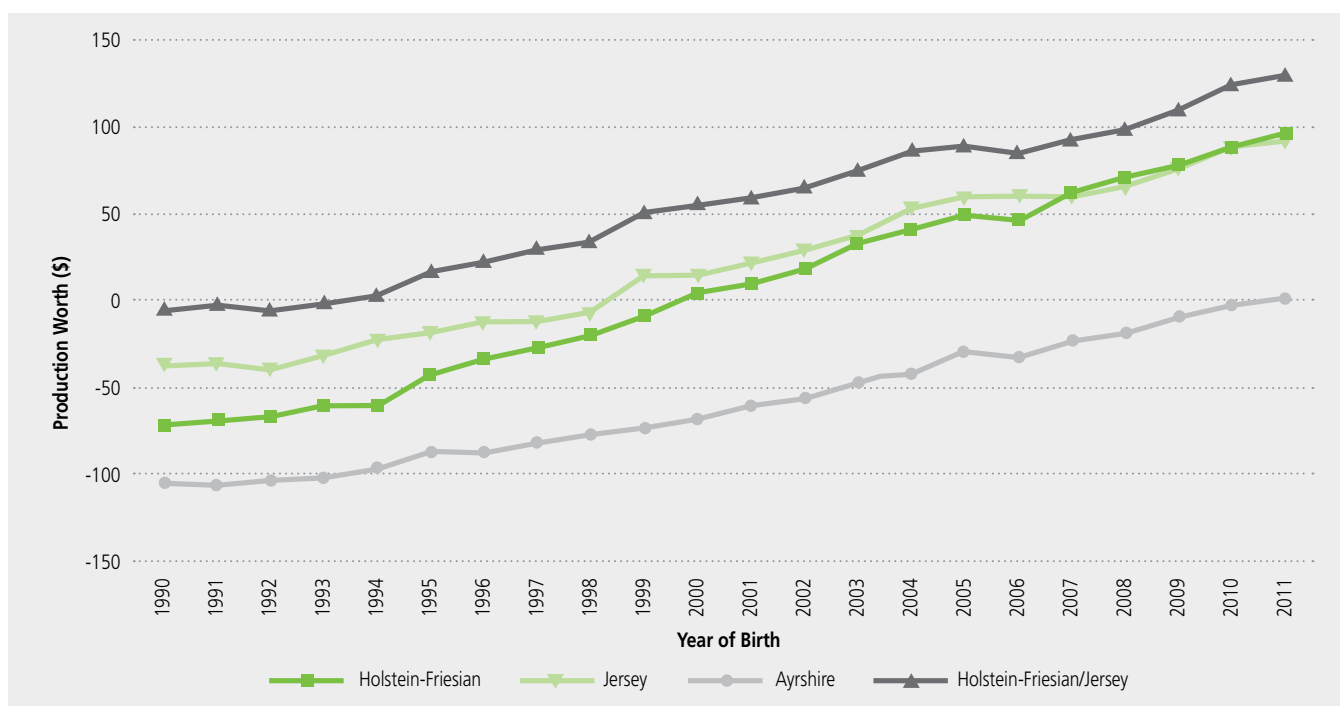
Graph 4.16: Trend in Breeding Worth for all cows



(Evaluation date: 12 May 2012)

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

Graph 4.17: Trend in Production Worth for all cows



(Evaluation date: 12 May 2012)

Table 4.16 shows the average BVs and BW by breed, of all 2009 born cows. The Holstein-Friesian/Jersey cows had the highest average BW at 92.9. 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 2009

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	85.2	15.1	17.7	529	33	0.03	0.6	-19	368,012
Jersey	89.2	4.4	-5.6	-524	-49	0.00	2.1	3	122,297
Ayrshire	-9.7	-5.3	0.9	62	3.2	-0.24	-3.5	132	7,575
Holstein-Friesian /Jersey	92.9	11.2	7.6	49	-4.1	0.01	1.5	-16	465,230
Guernsey	-209	-24	-17	-476	23.2	0.17	-5.4	-70	70
Milking Shorthorn	-124	-21	-11	-256	6.8	-0.10	-2	96	348
Brown Swiss	-136	-21	-6.8	-215	31.2	-0.24	-9.7	251	102
Other	69	6.6	5.9	51	-2.2	-0.05	0.2	-19	56,854
Weighted Average	87.5	11.4	9.5	153	4.1	0.01	1.1	-14	1,020,488

(Evaluation date: 12 May 2012)

Survivability is measured by the percentage of cows that have a lactation recorded for consecutive years. In the 2011/12 season, the value in the "2-3 years" column is the percentage of cows that were milking as two-year-olds in the 2010/11 season and are now milking as three-year-olds in the 2011/12 season. Table 4.17 shows that for the 2011/12 season the highest percentage of survival is in animals aged 3-4 years (87.7%), followed by animals aged 2-3 years (87.3%) and 4-5 years (86.8%).

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
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

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 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 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.

The regions in Chapter 5 refer to areas used by LIC. Appendix 1 shows a list of districts included in each region.

- *Average nominal dairy co-operative payout of \$6.40 similar to 2009/10*

The weighted average 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. \$6.40 per kg milksolids was the sixth highest payout since 1992-93 in inflation adjusted terms.

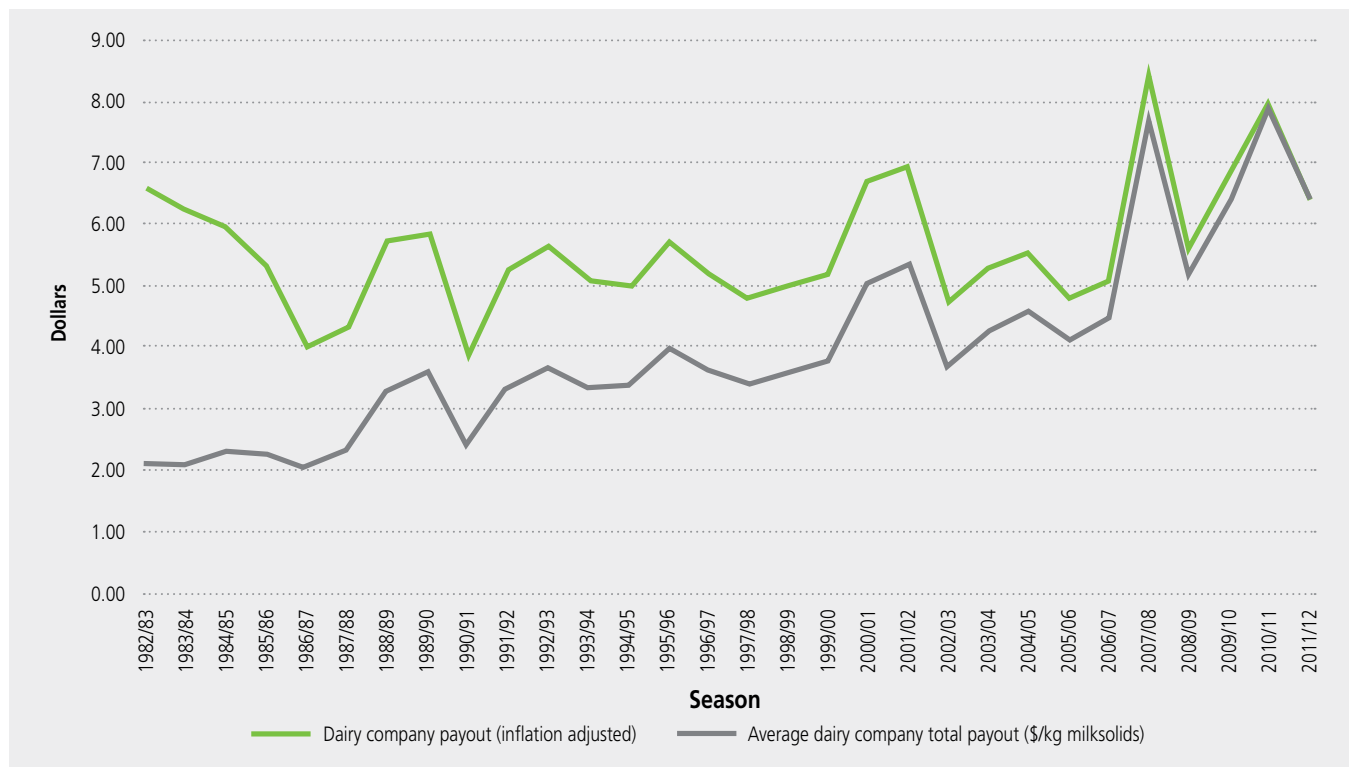
Table 5.1: Trend in prices received for milksolids for the last 20 seasons

Season	Average Dairy Company total payout (\$/kg milksolids)	Dairy Company payout (inflation adjusted) ^a
1992/93	3.66	5.67
1993/94	3.32	5.09
1994/95	3.40	4.99
1995/96	3.99	5.74
1996/97	3.63	5.16
1997/98	3.42	4.78
1998/99	3.58	5.03
1999/00	3.78	5.20
2000/01	5.01	6.68
2001/02	5.35	6.94
2002/03	3.66	4.68
2003/04	4.25	5.31
2004/05	4.58	5.56
2005/06	4.10	4.79
2006/07	4.46	5.11
2007/08	7.67	8.45
2008/09	5.14	5.55
2009/10 ^b	6.37	6.77
2010/11 ^b	7.89	7.97
2011/12 ^b	6.40	6.40

^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.

^b Average dairy co-operative payout (Fonterra, Tatua, Westland)

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



ii) Dairy farm land sale values

- Dairy farm land prices have been relatively steady for the past two seasons

Previously table 5.2 used data from Quotable Value (QV) on a calendar year. Dairy farm land sales will now be based on data provided by the Real Estate Institute of New Zealand (REINZ) on a seasonal basis. Raw data provided by REINZ have been weighted by the number of farms in each region. The farms sold are considered to be economic units.

The weighted average sale price of dairy farms (\$4.53 million) increased 8.7% in 2011/12 (Table 5.2). The weighted average sale price per hectare of \$32,123 is similar to the previous two seasons.

Table 5.2 Trend in dairy land sale values since 2009/10

season	Number of dairy farms sold	Weighted average sale price (\$)	Inflation adjusted weighted average sale price (\$)	Weighted average land area (ha)	Weighted average sale price/ha (\$)	Inflation adjusted weighted average sale price/ha (\$)	Weighted average sale price/kgMS (\$)	CPI
2009/10	90	4,128,586	4,387,797	145	31,618	33,603	39	1099
2010/11	143	4,136,532	4,175,859	143	32,726	33,037	38	1157
2011/12	157	4,532,603	4,532,603	171	32,123	32,123	40	1168

Source: Real Estate Institute of New Zealand (REINZ)

Note: Number of dairy farms sold is for a season (01-Jun to 31-May) and excludes support blocks and non-economic units. Figures have been weighted by the number of dairy farms in each region.

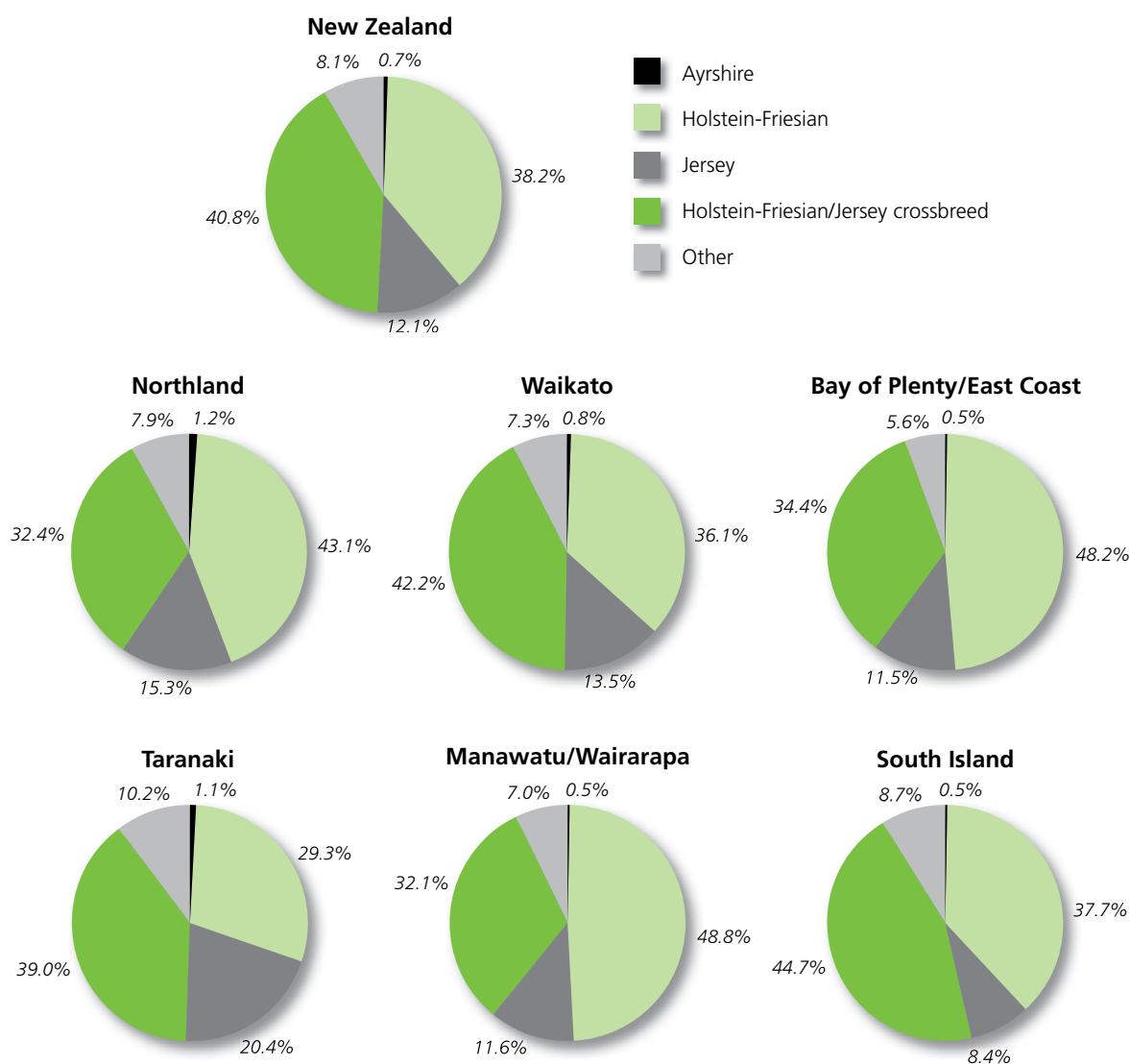
B. Breed breakdown

Three dairy breeds (Holstein-Friesian, Jersey, and Friesian/Jersey crossbred) 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 crossbred 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 crossbred and Ayrshire cows with the remaining breeds and crossbreeds grouped into "Other". Holstein-Friesian is the prevalent breed in Northland, Bay of Plenty/East Coast and Manawatu/Wairarapa. Waikato and the South Island now join Taranaki in having Holstein-Friesian/Jersey crossbred as the prevalent breed. The Manawatu/Wairarapa region continues to have the highest percentage of Holstein-Friesian cows (49%) followed closely by Bay of Plenty/East Coast (48%). Taranaki has the highest proportion of Jerseys (20%) and the South Island has the highest proportion of Holstein-Friesian/Jersey crossbreeds (45%), followed by Waikato (42%).

Graph 5.3: Breed percentages of cows in each LIC region in 2011/12



C. 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 282 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 Database for approximately 85% of all herds.

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.

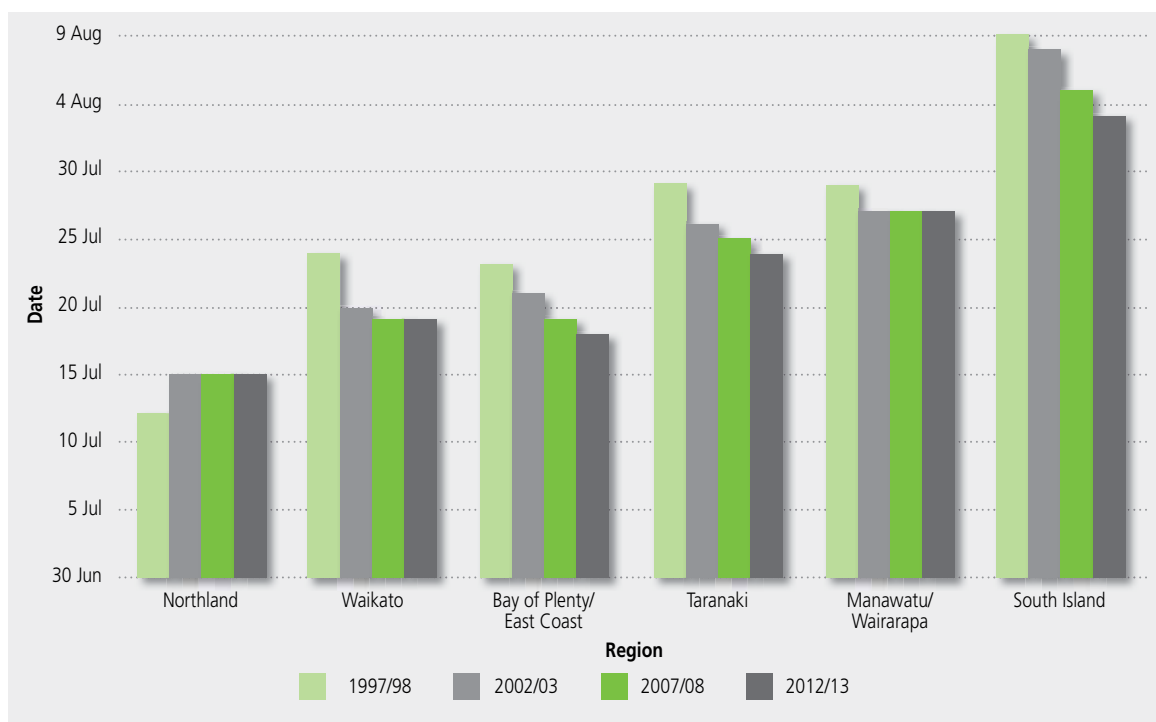
The forecast planned start of calving and actual median calving dates for cows (excluding first calvers) for the 2011/12 season are shown in Graph 5.4.

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



The planned start of calving for five-yearly intervals since 1996/97 is shown in Graph 5.5. The trend for most of the six regions (Waikato, Bay of Plenty/East Coast, Taranaki, and South Island) is for a similar or an earlier planned start of calving. Manawatu/Wairarapa seems steady on 28 July.

Graph 5.5: Trend in planned start of calving dates for cows (excluding first calvers) by LIC region



ii) 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 30 November. All records where pregnancy terminated prematurely or resulted in abortion or were induced, were excluded.

Table 5.3: Mean calving interval by breed since 2000/01

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
2007/08	369.9	2,349,042	370.4	985,422	369.7	366,954	369.5	853,422	371.0	21,239
2008/09	370.1	2,359,392	371.0	953,577	368.9	359,509	369.5	891,949	371.9	19,948
2009/10	368.7	2,477,122	369.1	972,118	368.3	361,329	368.5	980,435	369.3	16,745
2010/11	368.6	2,628,672	369.2	1,000,637	368.2	364,664	368.2	1,088,976	370.5	19,719

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 66% 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 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.

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 2011/12, not all farms with contract milkers could be identified, and consequently any farms with contract milkers are included with owner-operators.

- 34% of all herds are operated as sharemilkers
- 55% 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 2011/12, 4,034 (34%) New Zealand dairy herds operated under a sharemilking agreement. Fifty-five percent (2,218) of all sharemilkers have 50/50 agreements.

Table 5.4: Herd analysis by operating structure in 2011/12

Operating structure	Number of herds	Percentage of herds	Average herd size	Average effective hectares	Average cows per effective hectare
Owner-operators	7,764	65.8	389	139	2.80
Sharemilkers:					
less than 20%	234	2.0	619	197	3.14
20-29%	1,173	9.9	419	146	2.87
30-49%	193	1.6	346	123	2.82
50/50	2,218	18.8	372	130	2.87
Over 50%	216	1.8	379	130	2.91
All sharemilkers	4,034	34.2	399	138	2.89
All farms	11,798		393	139	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 and per effective hectare.

Table 5.5: Herd production analysis by operating structure in 2011/12

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	1,607,416	79,864	141,134	573	1,013	205	362
Sharemilkers:							
Less than 20%	2,780,264	139,007	246,763	706	1,253	225	399
20-29%	1,713,835	86,179	151,917	589	1,039	205	362
30-49%	1,437,701	72,036	127,089	588	1,037	208	367
50/50	1,518,597	76,478	134,644	589	1,038	206	362
Over 50%	1,583,367	78,484	138,943	603	1,067	207	367
All Sharemilkers	1,648,151	82,821	146,039	600	1,057	207	366
All farms	1,621,344	80,875	142,811	582	1,028	206	364

Note: Contract milkers are included with owner-operators

Changes to the operating structure in the last ten seasons have seen owner-operator percentages increase and the proportion of 50:50 sharemilkers decline. 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	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Owner-operators	62.5	62.7	63.7	63.9	63.4	63.1	63.6	65.1	65.4	65.8
Sharemilkers:										
Less than 20%	0.7	0.6	0.6	0.7	0.8	1.0	1.5	1.3	2.0	2.0
20-29%	8.8	8.6	8.2	8.6	8.8	9.1	10.4	10.5	10.9	9.9
30-49%	2.3	2.3	2.1	1.9	1.8	1.7	1.8	1.7	2.3	1.6
50/50	23.3	23.7	23.3	22.9	22.3	21.7	20.5	19.7	19.2	18.8
Over 50%	1.9	1.9	1.9	1.7	1.7	1.7	1.8	1.4	0.2	1.8
All sharemilkers	36.9	37.1	36.1	35.8	35.4	35.4	36.0	34.6	34.6	34.2
Other/Unknown	0.5	0.2	0.2	0.2	1.2	1.5	0.5	0.3	0.0	0.0

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

Operating structure	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Owner-operators	8,215	8,000	7,820	7,594	7,374	7,215	7,384	7,616	7,677	7,764
Sharemilkers:										
Less than 20%	96	78	68	78	93	119	177	147	233	234
20-29%	1,150	1,094	1,012	1,026	1,019	1,045	1,206	1,222	1,274	1,173
30-49%	298	292	257	231	208	198	207	200	273	193
50/50	3,064	3,027	2,863	2,719	2,599	2,483	2,381	2,303	2,249	2,218
Over 50%	246	239	228	206	203	199	207	169	29	216
All sharemilkers	4,854	4,730	4,428	4,260	4,122	4,044	4,178	4,041	4,058	4,034
Other/Unknown	71	21	23	29	134	177	56	34	0	0
Total	13,140	12,751	12,271	11,883	11,630	11,436	11,618	11,691	11,735	11,798

Table 5.8 compares the number (and percentage) of owner-operators with sharemilkers by region. In the South Island there were more variable order sharemilkers than 50/50 sharemilkers, while the opposite was the case in 2011/12 in the North island.

Table 5.8: Operating structure by region in 2011/12

<i>Farming region</i>	<i>Owner-operators</i>	<i>Owner-operators %</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</i>
Northland	711	9.2	222	5.5	122	5.5	100	5.5	933
Auckland	278	3.6	162	4.0	99	4.5	63	3.5	440
Waikato	2,257	29.1	1,299	32.2	842	38.0	457	25.2	3,556
Bay of Plenty	412	5.3	185	4.6	109	4.9	76	4.2	597
Central Plateau	300	3.9	164	4.1	101	4.6	63	3.5	464
Western Uplands	54	0.7	30	0.7	18	0.8	12	0.7	84
East Coast	7	0.1	2	0.0	1	0.0	1	0.1	9
Hawkes Bay	57	0.7	14	0.3	10	0.5	4	0.2	71
Taranaki	1,017	13.1	714	17.7	349	15.7	365	20.1	1,731
Manawatu	418	5.4	144	3.6	70	3.2	74	4.1	562
Wairarapa	328	4.2	137	3.4	67	3.0	70	3.9	465
North Island	5,839	75.2	3,073	76.2	1,788	80.6	1,285	70.8	8,912
Nelson/Marlborough	197	2.5	40	1.0	24	1.1	16	0.9	237
West Coast	289	3.7	85	2.1	40	1.8	45	2.5	374
North Canterbury	502	6.5	222	5.5	111	5.0	111	6.1	724
South Canterbury	157	2.0	91	2.3	30	1.4	61	3.4	248
Otago	208	2.7	191	4.7	79	3.6	112	6.2	399
Southland	572	7.4	332	8.2	146	6.6	186	10.2	904
South Island	1,925	24.8	961	23.8	430	19.4	531	29.2	2,886
New Zealand	7,764	100.0	4,034	100.0	2,218	100.0	1,816	100.0	11,798

Table 5.9 shows the number and percentage of owner-operators and sharemilkers by herd size.

Table 5.9: Operating structure by herd size in 2011/12

<i>Herd size</i>	<i>Owner-operators</i>	<i>Owner-operators %</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</i>
10-49	14	0.2	2	0.0	1	0.0	1	0.1	16
50-99	235	3.0	30	0.7	15	0.7	15	0.8	265
100-149	636	8.2	166	4.1	95	4.3	71	3.9	802
150-199	1,020	13.1	434	10.8	279	12.6	155	8.5	1,454
200-249	1,111	14.3	602	14.9	385	17.4	217	11.9	1,713
250-299	795	10.2	445	11.0	281	12.7	164	9.0	1,240
300-349	741	9.5	481	11.9	267	12.0	214	11.8	1,222
350-399	471	6.1	319	7.9	168	7.6	151	8.3	790
400-449	453	5.8	309	7.7	149	6.7	160	8.8	762
450-499	343	4.4	227	5.6	117	5.3	110	6.1	570
500-549	331	4.3	202	5.0	91	4.1	111	6.1	533
550-599	228	2.9	152	3.8	75	3.4	77	4.2	380
600-649	244	3.1	141	3.5	58	2.6	83	4.6	385
650-699	179	2.3	94	2.3	35	1.6	59	3.2	273
700-749	138	1.8	89	2.2	40	1.8	49	2.7	227
750-799	124	1.6	62	1.5	36	1.6	26	1.4	186
800-849	119	1.5	40	1.0	18	0.8	22	1.2	159
850-899	77	1.0	44	1.1	17	0.8	27	1.5	121
900-949	87	1.1	39	1.0	19	0.9	20	1.1	126
950-999	57	0.7	24	0.6	15	0.7	9	0.5	81
1000-1099	114	1.5	41	1.0	20	0.9	21	1.2	155
1100-1199	75	1.0	23	0.6	11	0.5	12	0.7	98
1200-1499	91	1.2	44	1.1	17	0.8	27	1.5	135
1500+	81	1.0	24	0.6	9	0.4	15	0.8	105
Total/Avg	7,764	100.0	4,034	100.0	2,218	100.0	1,816	100.0	11,798

6. Disease control

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

For the fifth consecutive year no cases of EBL have been identified in New Zealand (Table 6.1).

Table 6.1: Summary of EBL status, April 2008–2012

<i>NZ dairy herd EBL status</i>	<i>April 2012</i>	<i>April 2011</i>	<i>April 2010</i>	<i>April 2009</i>	<i>April 2008</i>
Total NZ dairy herds	11,113	11,028	11,029	11,128	11,323
Herds tested (%)	15	53	52	55	64
Annual period prevalence (%)	0.000	0.000	0.000	0.000	0.000
EBL-free herds* (%)	100.00	100.00	99.98	99.99	99.98

*EBL-free herd: Test negative for three seasons after provisionally negative status.

After the last EBL-infected cows were culled in 2007–2008, annual screening of the dairy industry was maintained at over 50% of all herds for several years to ensure that any remaining pockets of infection might be identified and eradicated. In the absence of any evidence of EBL for four years, it was decided to scale back monitoring in 2011–2012 to 1600 herds.

In addition to herd screening and follow-up, several suspicious cases identified as a result of natural mating by bull, export shipment testing, and in the course of routine veterinary diagnostic work (e.g., lymphosarcoma), were followed up with additional sampling and re-testing by ELISA and PCR panel. All confirmatory tests gave unambiguous negative results.

The NZ Dairy EBL Control Scheme is funded by DairyNZ and administered by Livestock Improvement.

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 (e.g., possums and ferrets) that are considered a source of infection.

Both the number of infected dairy herds (from 42 to 39) and the number of Tuberculous dairy cattle declined in 2011/12. The number of Tuberculous dairy cattle dropped 30% (from 116 to 81), with all of the decline occurring in the South Island.

Table 6.2: Tuberculosis (Tb) testing and results in 2011/12

Region	Vector Status	Number of infected dairy herds June 2012	Number of dairy cattle primary tested	Number of Tuberculous ^a dairy cattle
Northland	Free	0	106,555	0
Auckland	Free	0	22,281	0
Waikato	Free	0	660,151	0
	Risk	2	290,866	9
Bay of Plenty	Free	0	70,499	0
	Risk	0	8,455	0
Gisborne	Free	0	1,017	0
Hawke's Bay	Free	0	9,400	0
	Risk	0	38,246	0
Taranaki	Free	1	177,345	1
Manawatu/Wanganui	Free	0	95,614	0
	Risk	0	70,694	0
Wellington	Risk	0	89,017	0
North Island	Free	1	1,142,862	1
	Risk	2	497,278	9
North Island	Total	3	1,640,140	10
Marlborough	Free	0	8,119	0
	Risk	0	4,202	0
Tasman/Nelson	Free	1	37,319	0
	Risk	1	22,961	2
West Coast	Free	0	5,434	0
	Risk	30	234,680	64
Canterbury	Free	0	310,202	0
	Risk	0	163,790	1
Otago	Free	0	80,205	0
	Risk	2	152,744	2
Southland	Free	0	146,282	0
	Risk	2	97,165	2
South Island	Free	1	587,561	0
	Risk	35	675,542	71
South Island	Total	36	1,263,103	71
New Zealand	Free	2	1,730,423	1
	Risk	37	1,172,820	80
New Zealand	Total	39	2,903,243	81

Sourced from Animal Health Board - Annual Report for the year ending 30 June 2012

^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 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

