



New Zealand Dairy Statistics 2009-10



Profitability. Sustainability. Competitiveness.

Copyright in this publication (including text, graphics, logos and icons) is owned by or licensed to DairyNZ. Other than for the purposes of, and subject to the conditions prescribed under, the Copyright Act 1994 and similar legislation which applies in your location, and except as expressly authorised by these terms and conditions, you may not in any form or by any means adapt, reproduce, store, distribute, print, display, perform, publish or create derivative works from any part of this publication or commercialise any information, products or services obtained from any part of this publication without our written permission.

Price for hand-held copy: \$35.00 (excl. GST).

New Zealand Dairy Statistics is also available online, at no charge, at: **www.lic.co.nz** (select *News and Publications*, followed by *Publications*), or at: **www.dairynz.co.nz/dairystatistics**



Statistics
LIC
Private Bag 3016
Hamilton 3240
New Zealand
Telephone: 64-7-856 0700
Fax: 64-7-856 0608
Email: minda@lic.co.nz
Website: **www.lic.co.nz**



Profitability. Sustainability. Competitiveness.

DairyNZ
Private Bag 3221
Hamilton 3240
New Zealand
Telephone: 0800 4 DAIRYNZ
Fax: 64-7-858 3751
Email: info@dairynz.co.nz
Website: **www.dairynz.co.nz**

Contents

1.	Introduction	4
2.	National dairy statistics	5
	A. Industry statistics	5
	i) Production	5
	ii) Population	6
	B. Herd production statistics	8
	i) Production per cow	9
	ii) Herd size distribution	11
3.	Regional dairy statistics	13
4.	Herd improvement	20
	A. Use of herd testing	20
	B. Herd test averages	22
	i) Season averages	22
	ii) Monthly averages	24
	iii) Breed averages	26
	C. Artificial Breeding (AB) statistics	28
	D. Animal Evaluation	33
5.	General statistics	39
	A. Prices received by dairy farmers	39
	i) Milksolids	39
	ii) Dairy farm land sale values	41
	B. Breed breakdown	43
	C. Calving	44
	i) Planned start of calving and median calving dates	44
	ii) Calving interval	45
	D. Operating structures	46
6.	Disease control	50
	A. New Zealand dairy herd Enzootic Bovine Leucosis (EBL) control scheme	50
	B. Tuberculosis (Tb) control	51
	Appendix 1: Farming regions and districts	52

List of tables

2.1	Summary of milk production statistics for the last 30 seasons	5
2.2	Summary of herd statistics since 1974/75	7
2.3	Summary of herd production since 1974/75	8
2.4	Average production per cow by herd size in 2009/10	11
3.1	Herd analysis by region in 2009/10	14
3.2	Herd production analysis by region in 2009/10	15
3.3	Herd analysis by district in 2009/10	16
3.4	Herd production analysis by district in 2009/10	18
4.1	Trend in the use of herd testing services for the last 20 seasons	20
4.2	Use of herd testing by region in 2009/10	21
4.3	Season herd test averages per cow by region in 2009/10	22
4.4	Trend in the national herd test averages for the last 20 seasons	23
4.5	Monthly herd test averages by region in 2009/10	24
4.6	Herd test breed averages by age of cow in 2009/10	26
4.7	Liveweight by age and breed of cow in 2009/10	27
4.8	Trend in Artificial Breeding use for the last nine seasons by LIC region: Cows and yearlings to AB	28
4.9	Economic values used from 15 February 2010	33
4.10	Average Breeding Values and Breeding Worth of 2005-born bulls	34
4.11	Number of sires by birth year and breed	34
4.12	Herd Breeding Worth in 2009/10	35
4.13	Herd Production Worth in 2009/10	35
4.14	Cow Breeding Worth in 2009/10	36
4.15	Cow Production Worth in 2009/10	36
4.16	Average Breeding Worth and Breeding Values of all cows by breed born in 2007	38
4.17	Survivability percentages since 1996/97	38
5.1	Trend in prices received for milksolids for the last 20 seasons	39
5.2	Trend in dairy land sale values for the last 20 years	41
5.3	Mean calving interval	45
5.4	Herd analysis by operating structure in 2009/10	46
5.5	Herd production analysis by operating structure in 2009/10	47
5.6	Trend in the percentage of herds in each operating structure for the last 10 seasons	47
5.7	Trend in the number of herds in each operating structure for the last 10 seasons	47
5.8	Operating structure by region in 2009/10	48
5.9	Operating structure by herd size in 2009/10	49
6.1	Summary of EBL status point-prevalences at the end of the season from 2006 to 2010	50
6.2	Tuberculosis (Tb) testing and results in 2009/10	51

List of graphs

2.1	Trend in the number of herds and average herd size for the last 30 seasons	6
2.2	Trend in milksolids production per cow since 1992/93	9
2.3	Distribution of herds by milksolids production per cow for the last three seasons	10
2.4	Herd size distribution for 2009/10 compared with 2004/05	12
3.1	Regional distribution of dairy cows in 2009/10	13
4.1	Trend in the percentage of herds testing for the last 30 seasons	21
4.2	Average milkfat and protein production per cow in 2009/10	23
4.3	Liveweight by age and breed of cow in 2009/10	27
4.4	Trend in the percentage of cows to Artificial Breeding for the last 30 seasons	29
4.5	Average number of inseminations per cow for the last 20 seasons	30
4.6	Ayrshire semen usage (%) over cow breed for the last five seasons	30
4.7	Crossbreed semen usage (%) over cow breed for the last five seasons	31
4.8	Jersey semen usage (%) over cow breed for the last five seasons	31
4.9	Holstein-Friesian semen usage (%) over cow breed for the last five seasons	31
4.10	Trend in the percentage of inseminations of each major breed for the last 40 seasons	32
4.11	Genetic trend of proven dairy bulls by year of birth	34
4.12	Distribution of Herd Breeding Worth in 2009/10	35
4.13	Distribution of Herd Production Worth in 2009/10	35
4.14	Distribution of Cow Breeding Worth in 2009/10	36
4.15	Distribution of Cow Production Worth in 2009/10	36
4.16	Trend in Breeding Worth for all cows	37
4.17	Trend in Production Worth for all cows	37
5.1	Trend in milksolids payout to dairy farmers for the last 30 seasons	40
5.2	Trend in dairy land values (price per hectare) for the last 20 years	42
5.3	Breed percentages of cows in each LIC region in 2009/10	43
5.4	Planned start of calving and median calving dates for cows (excluding first calvers) by LIC region	44
5.5	Trend in planned start of calving dates for cows (excluding first calvers) by LIC region	45

1. Introduction

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

Data is sourced from the LIC National Database, dairy companies, Animal Evaluation database, Animal Health Board Annual Report (year ending 30 June 2010), Quotable Value New Zealand Rural Property Sales Statistics, and Statistics New Zealand.

New Zealand Dairy Statistics 2009/10 is a report that shows historical information up to and including the 2009/10 season. Data for previous years were released under *Dairy Statistics* from 1998, *Annual Report (Livestock Improvement Division)* in 1987/88, *Livestock Improvement Report* from 1984/85 to 1986/87, and *New Zealand Dairy Board Farm Production Report* up to 1983/84.

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

As of March 2002, LIC became a user-owned co-operative, with responsibility for farm production activities and, in particular, dairy herd improvement and herd records.

LIC's activities can broadly be described as genetics, information and advice. Services provided to farmers include farm management information, herd testing and artificial breeding services, DNA analysis, a farm advisory service, research to improve farm profitability, statistical information related to the New Zealand dairy industry, and herd recording on the LIC Database.

2. National dairy statistics

A. Industry statistics

i) Production

- 3.3% increase in milksolids processed

In 2009/10, dairy companies processed 16.5 billion litres of milk containing 1.44 billion kilograms of milksolids (Table 2.1). Total milksolids processed increased by 3.3% from the 1.39 billion kilograms processed in the previous season. The increase was due to more cows milked.

Table 2.1: Summary of milk production statistics for the last 30 seasons

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

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.

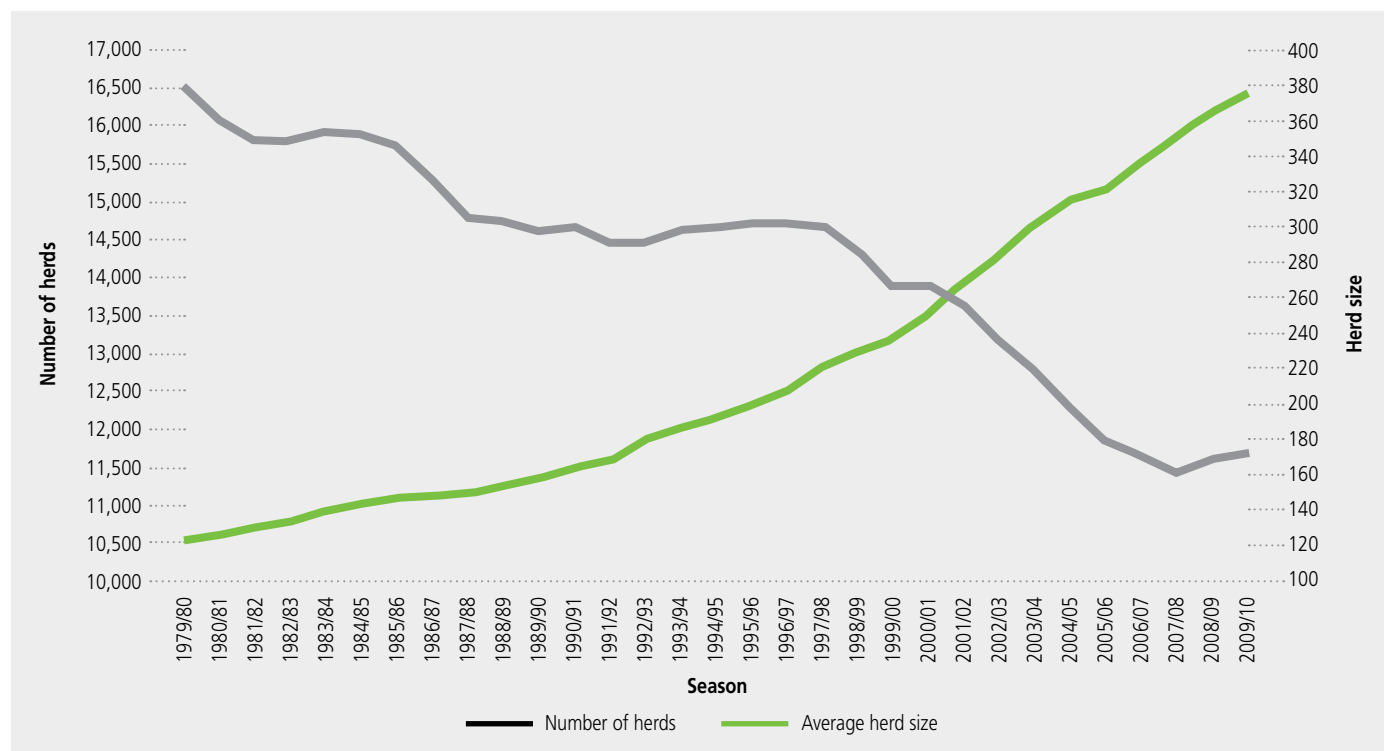
ii) Population

- Slight increase in the number of herds
- Average herd size continues to increase
- Cow numbers increase by 144,000 to 4.4 million cows

Since 1979/80 total herd numbers have declined at an average rate of 160 herds per year (Graph 2.1). However, the total number of herds in the 2009/10 season increased by 73 (to 11,691), over the previous year. This was the second consecutive year of increasing herd numbers.

The average herd size was 376 in 2009/10. This is an increase of 10 cows on the previous season. The increase is consistent with the trend for the past 30 seasons. The average herd size has tripled in the last 30 years, and has increased by more than 100 cows in the last eight years.

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



The total cow population in the 2009/10 season was 4.4 million (Table 2.2), an increase of 3.4% over the previous season. Average effective hectares increased to 134 hectares. A stocking rate of 2.81 cows per hectare was up slightly on the previous season and is the highest stocking rate recorded. Total effective hectares (runoff excluded) were 1.56 million.

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

- 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

- Production per herd is up on last season
- Production per hectare, and per cow is down 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 in 2009/10 (912 kg) was 1.0% lower than the previous season at 921 kg/ha. Production per cow decreased by 1.5% in 2009/10 to an average of 318 kg milksolids (comprising 181 kg milkfat and 137 kg protein).

Table 2.3: Summary of herd production since 1974/75

Season	Average litres per herd	Average kg milkfat per herd	Average kg protein per herd	Average kg milksolids per herd	Average kg milkfat per effective hectare	Average kg protein per effective hectare	Average kg milksolids per effective hectare	Average litres per cow	Average kg milkfat per cow	Average kg protein per cow	Average kg milksolids per cow
1974/75 ^a	-	14,400	-	-	-	-	-	-	128	-	-
1975/76 ^a	-	15,700	-	-	-	-	-	-	137	-	-
1976/77 ^a	-	16,600	-	-	-	-	-	-	143	-	-
1977/78 ^a	-	15,700	-	-	-	-	-	-	131	-	-
1978/79 ^a	-	17,500	-	-	-	-	-	-	142	-	-
1979/80 ^a	-	19,000	-	-	-	-	-	-	151	-	-
1980/81 ^a	-	18,864	-	-	-	-	-	-	147	-	-
1981/82 ^a	-	19,090	-	-	310	-	-	-	144	-	-
1982/83 ^a	-	19,600	-	-	312	-	-	-	143	-	-
1983/84 ^a	-	21,618	-	-	345	-	-	-	154	-	-
1984/85 ^a	-	22,190	-	-	359	-	-	-	152	-	-
1985/86 ^a	-	23,489	-	-	379	-	-	-	157	-	-
1986/87 ^a	-	20,885	-	-	331	-	-	-	138	-	-
1987/88 ^a	-	23,500	-	-	374	-	-	-	154	-	-
1988/89 ^a	-	22,442	-	-	340	-	-	-	143	-	-
1989/90 ^a	-	23,578	-	-	352	-	-	-	147	-	-
1990/91 ^a	-	24,495	-	-	351	-	-	-	148	-	-
1991/92 ^b	-	26,567	-	-	-	-	-	-	157	-	-
1992/93	554,040	26,982	20,138	47,120	374	279	653	-	148	111	259
1993/94	618,139	30,220	22,458	52,678	407	301	708	-	160	119	278
1994/95	614,203	29,886	22,117	52,002	386	285	671	-	156	115	271
1995/96	663,248	32,050	23,827	55,877	405	300	705	-	163	120	283
1996/97	728,874	35,436	26,387	61,823	425	316	741	-	173	128	301
1997/98	752,399	36,383	26,984	63,367	430	318	748	-	168	124	292
1998/99	735,544	35,047	26,254	61,301	392	292	684	-	147	109	256
1999/00	839,066	40,365	30,396	70,761	439	329	768	-	165	123	288
2000/01	930,047	45,063	33,850	78,914	472	353	825	-	177	133	310
2001/02	996,904	48,137	36,300	84,436	471	353	824	-	175	132	307
2002/03	1,058,307	51,447	39,174	90,621	471	357	828	-	179	136	315
2003/04	1,144,938	56,150	42,171	98,321	509	380	889	3,737	184	138	322
2004/05	1,149,262	56,520	42,305	98,825	494	368	862	3,574	176	132	308
2005/06	1,237,228	60,955	45,705	106,660	520	387	907	3,763	186	139	325
2006/07	1,301,308	64,495	48,687	113,182	534	400	934	3,791	189	142	330
2007/08	1,289,337	63,158	47,876	111,033	498	375	873	3,567	175	132	307
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

- Not available

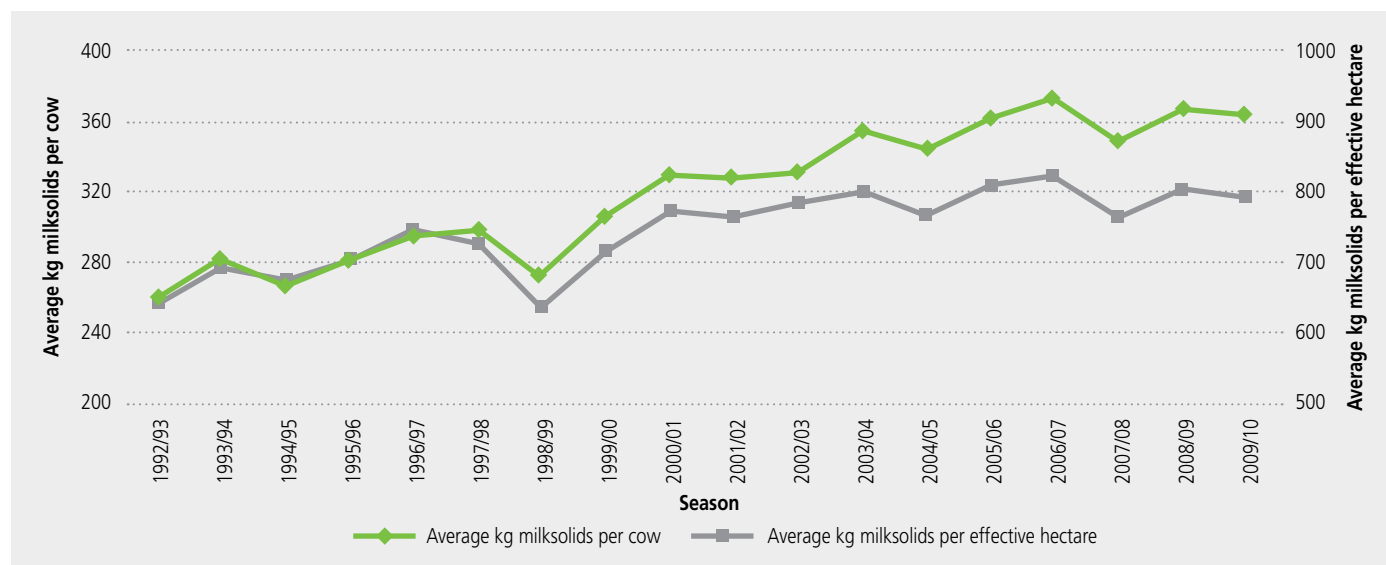
^a Figures prior to 1991/92 exclude town milk herds

^b 1991/92 figures include some town milk herds

i) Production per cow

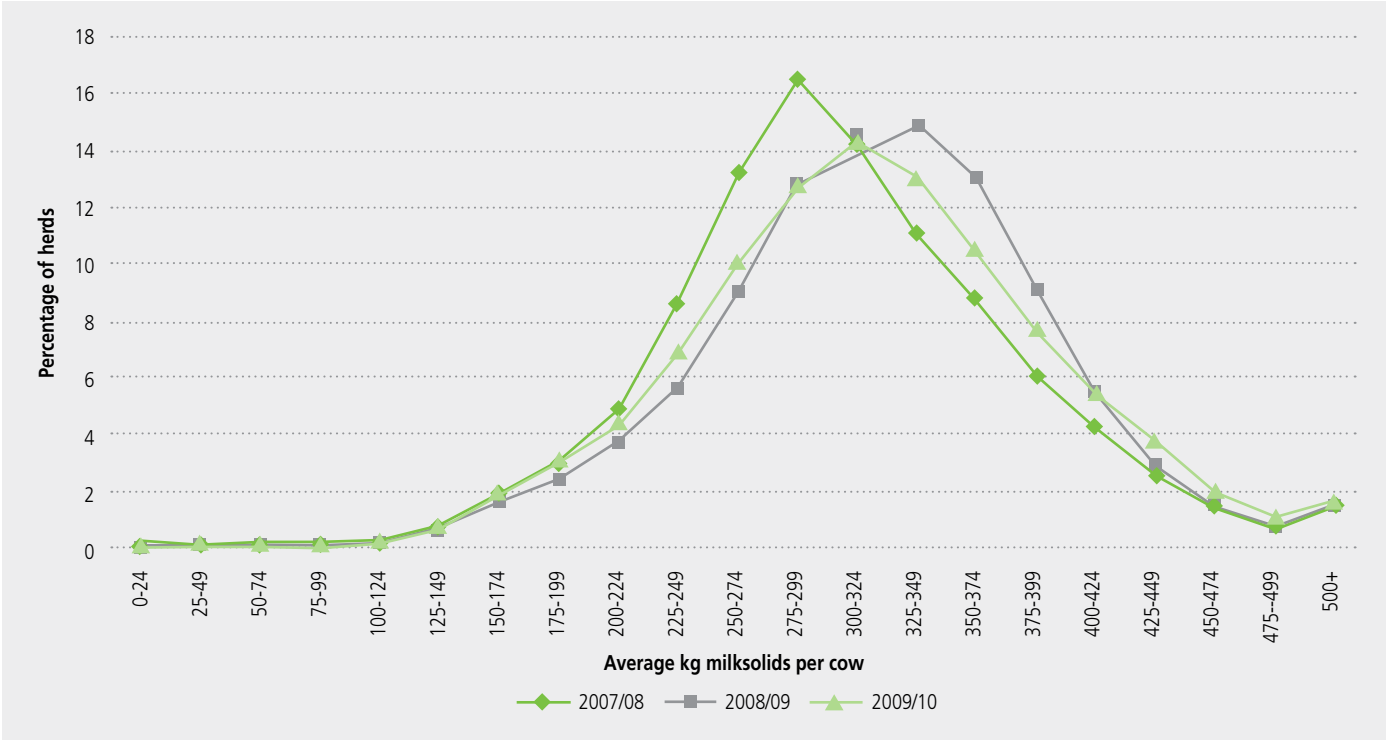
There has been no increase in milksolids production per cow over the past several years (Graph 2.2). Milk production per hectare has increased over the last few years driven by increasing stocking rates. Variations from season to season are masked by the considerable effect of the weather on each season's actual production. For example, unfavourable weather conditions in 1998/99 caused production per cow to fall to its lowest level since 1992/93. Likewise widespread drought in 2008/09 caused milk production to decline. Production per cow and per effective hectare for the 2009/10 season was slightly lower compared with the previous season.

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, genetic merit of the herd, and farm management practice. Graph 2.3 shows a strong recovery in milksolids production compared to the 2007/08 season, but production did not reach the levels of the previous season.

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



ii) Herd size distribution

- Half of all herds have 300 or more cows
- Herds with between 850 and 899 cows have highest production per cow

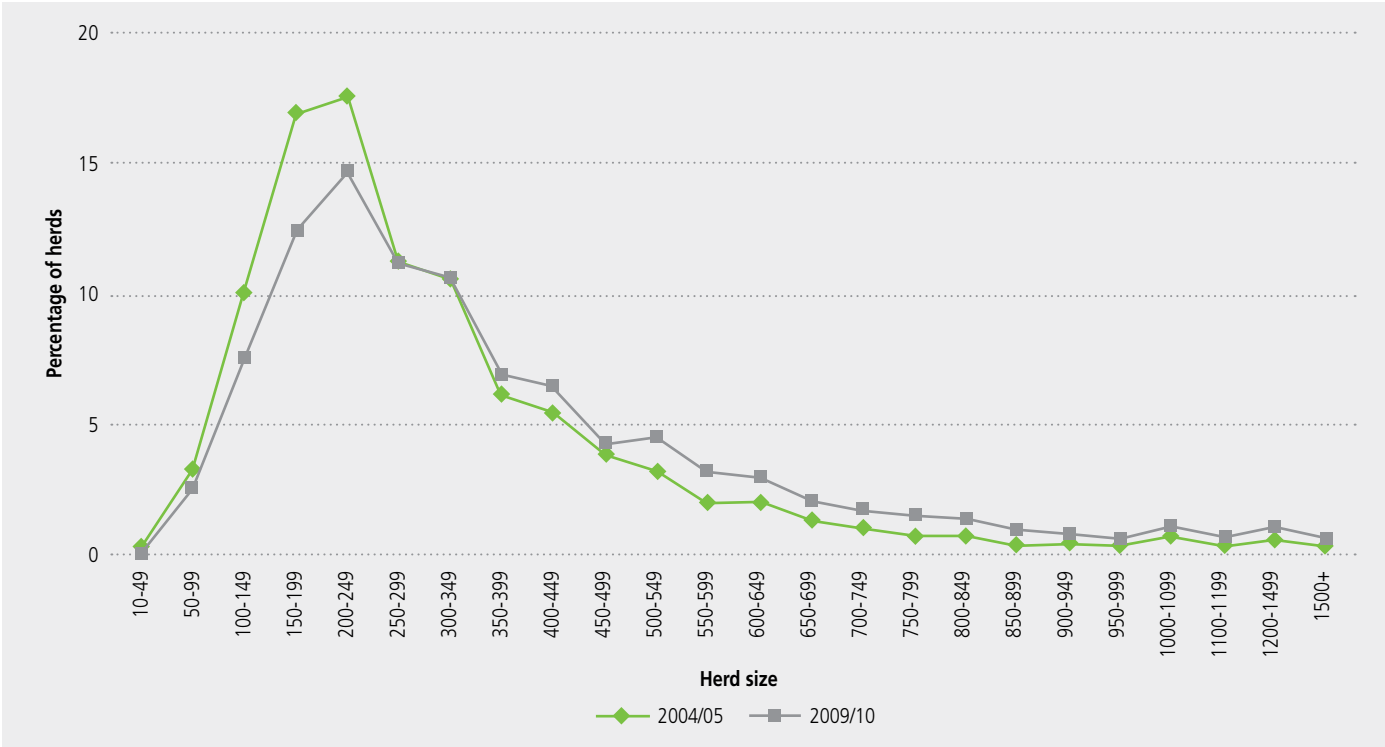
A little under fifteen percent (1,719) of herds have between 200 and 249 cows (Table 2.4). Fifty-six percent of all herds have between 100 and 349 cows. In 2009/10, 5,762 herds (49%) had 300 or more cows, 2,444 (21%) had 500 or more cows and 400 (3%) had over 1,000 cows. Average milkfat, protein and milksolids per cow by herd size are also included in Table 2.4. Average milksolids per cow varies between 216 kg (herds with 50-99 cows) and 359 kg (herds with 850-899 cows). A decade ago (1999/00) only 20.1% of herds had more than 300 cows and 4.8% (664) had more than 500 cows. Compare this to 2009/10, when the numbers were 50% and 21.3% respectively.

Table 2.4: Average production per cow by herd size in 2009/10

<i>Herd size</i>	<i>Number of herds</i>	<i>Percentage of herds</i>	<i>Number of cows</i>	<i>Percentage of cows</i>	<i>Average kg milkfat per cow</i>	<i>Average kg protein per cow</i>	<i>Average kg milksolids per cow</i>
10-49	13	0.1	473	0.0	181	135	316
50-99	296	2.5	23,277	0.5	123	93	216
100-149	880	7.5	109,689	2.5	162	122	283
150-199	1,448	12.4	250,466	5.7	172	129	301
200-249	1,719	14.7	380,355	8.7	179	134	314
250-299	1,305	11.2	351,252	8.0	182	137	319
300-349	1,243	10.6	395,472	9.0	183	137	320
350-399	804	6.9	296,061	6.7	186	140	326
400-449	763	6.5	318,362	7.2	188	142	331
450-499	508	4.3	237,152	5.4	192	146	338
500-549	525	4.5	270,541	6.2	194	148	341
550-599	375	3.2	212,533	4.8	194	148	342
600-649	345	3.0	212,218	4.8	195	149	343
650-699	247	2.1	164,059	3.7	196	150	346
700-749	204	1.7	145,704	3.3	195	151	346
750-799	178	1.5	135,849	3.1	192	148	340
800-849	158	1.4	128,299	2.9	195	151	347
850-899	114	1.0	98,218	2.2	202	157	359
900-949	96	0.8	87,658	2.0	198	153	351
950-999	70	0.6	67,434	1.5	196	152	349
1000- 1099	132	1.1	135,104	3.1	189	146	336
1100-1199	74	0.6	83,310	1.9	178	139	317
1200-1499	120	1.0	154,385	3.5	189	147	336
1500+	74	0.6	138,804	3.2	157	123	280
Total/Avg	11,691		4,396,675		181	137	318

The herd size distribution presented in Graph 2.4 shows an increase in larger herds (350+ cows) and a decrease in herds with fewer than 250 cows since 2004/05. The most common herd size continues to range between 200 and 249 cows (comprising 14.7% of herds, compared with 17.6% in 2004/05).

Graph 2.4: Herd size distribution for 2009/10 compared with 2004/05



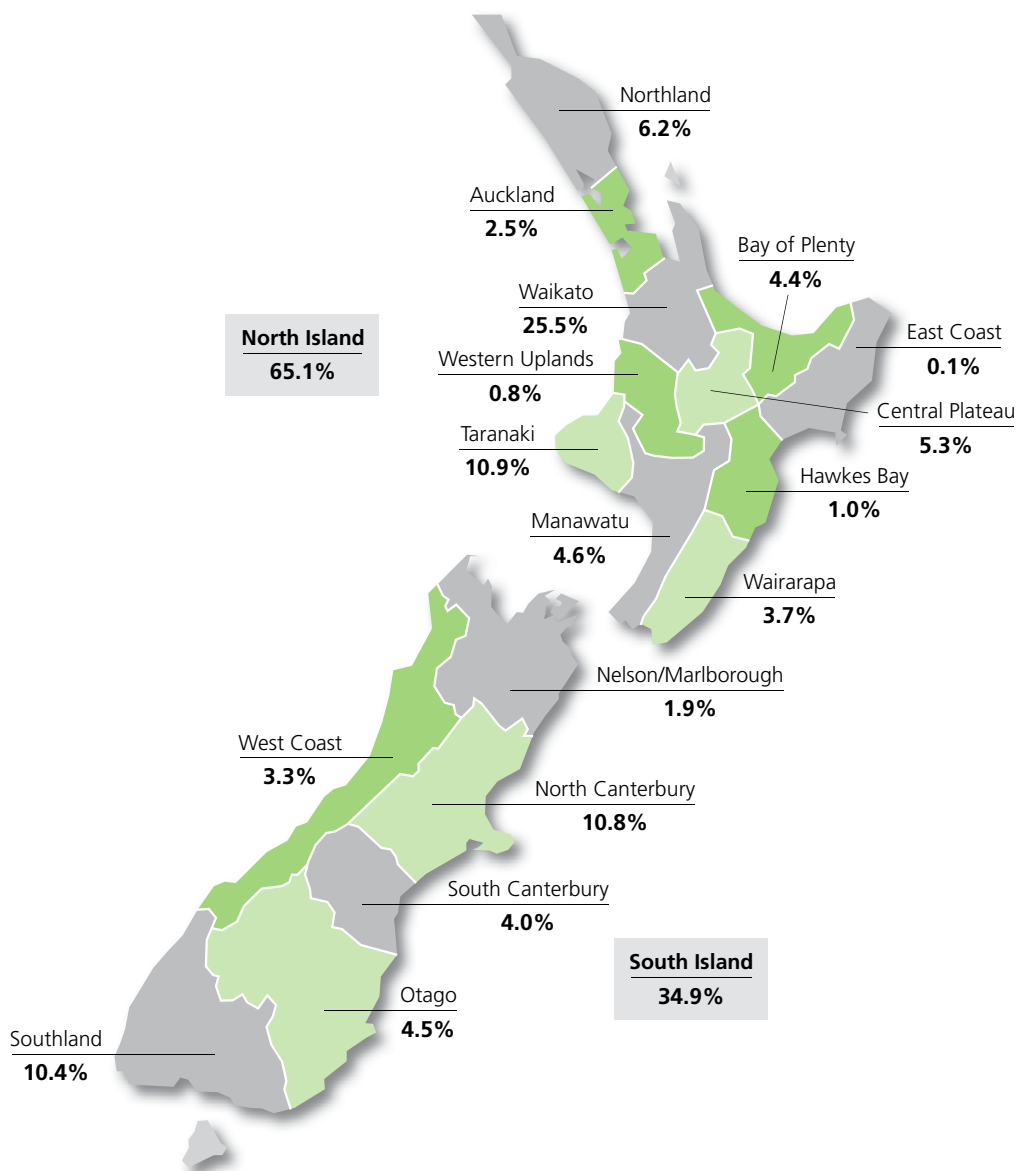
3. Regional dairy statistics

- 35% of all dairy cows are located in the South Island

The majority of dairy herds (77%) are located in the North Island, with the greatest concentration (31%) 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 a little less than one-quarter of the national total, they contain over one-third of all cows (Graph 3.1). Twenty-six percent of all cows are located in the Waikato region, followed by Taranaki (11%), North Canterbury (11%) and Southland (10%).

Graph 3.1: Regional distribution of dairy cows in 2009/10



- *More than 1.5 million cows in the South Island*
- *Largest average herd size (732) in North 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-five percent of all cows are in the North Island, with 26% in the Waikato region. The average herd size in both islands continues to increase. Within the South Island, North Canterbury has the largest average herd size (732 cows). In the North Island, Hawkes Bay has the largest average herd size of 656 cows. The smallest herd sizes are in Auckland, Taranaki, and Northland, averaging 244, 272 and 292 cows respectively. North Canterbury has the highest average cows per hectare (3.35), followed closely by South Canterbury (3.33). The regions with the lowest average cows per hectare are the West Coast (2.22) and Northland (2.26).

Table 3.1: Herd analysis by region in 2009/10

<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	929	7.9	271,611	6.2	120,380	7.7	292	130	2.26
Auckland	448	3.8	109,405	2.5	45,672	2.9	244	102	2.40
Waikato	3,571	30.5	1,120,653	25.5	378,796	24.2	314	106	2.96
Bay of Plenty	609	5.2	192,869	4.4	67,986	4.3	317	112	2.84
Central Plateau	461	3.9	232,575	5.3	86,580	5.5	505	188	2.69
Western Uplands	82	0.7	36,974	0.8	14,213	0.9	451	173	2.60
East Coast	14	0.1	5,571	0.1	2,310	0.1	398	165	2.41
Hawkes Bay	70	0.6	45,920	1.0	15,611	1.0	656	223	2.94
Taranaki	1,759	15.0	478,323	10.9	169,344	10.8	272	96	2.82
Manawatu	558	4.8	202,849	4.6	74,417	4.8	364	133	2.73
Wairarapa	472	4.0	164,865	3.7	59,778	3.8	349	127	2.76
North Island	8,973	76.8	2,861,615	65.1	1,035,087	66.2	319	115	2.76
Nelson/ Marlborough	241	2.1	83,119	1.9	29,891	1.9	345	124	2.78
West Coast	368	3.1	143,558	3.3	64,613	4.1	390	176	2.22
North Canterbury	649	5.6	475,245	10.8	142,058	9.1	732	219	3.35
South Canterbury	242	2.1	176,085	4.0	52,804	3.4	728	218	3.33
Otago	368	3.1	198,747	4.5	69,293	4.4	540	188	2.87
Southland	850	7.3	458,306	10.4	169,749	10.9	539	200	2.70
South Island	2,718	23.2	1,535,060	34.9	528,408	33.8	565	194	2.91
New Zealand	11,691		4,396,675		1,563,495		376	134	2.81

- *Highest average production per herd, 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 North Canterbury recording the highest average herd production at 280,935 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 198,202 kilograms of milksolids, reflecting large herd sizes.

In 2009/10, 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 (1,283 kg), while Taranaki had the highest average milksolids production per hectare in the North Island (935 kg).

North Canterbury also had the highest average milksolids per cow (384 kg), followed by Southland (376 kg). In the North Island, Manawatu had the highest average milksolids per cow (334 kg), followed closely by Wairarapa (332 kg) and Taranaki (331 kg).

Table 3.2: Herd production analysis by region in 2009/10

<i>Farming region</i>	<i>Total kg milksolids</i>	<i>Percent milksolids</i>	<i>Average litres per herd</i>	<i>Average kg milkfat per herd</i>	<i>Average kg protein per herd</i>	<i>Average kg milksolids per herd</i>	<i>Average kg milkfat per effective hectare</i>	<i>Average kg protein per effective hectare</i>	<i>Average kg milksolids per effective hectare</i>	<i>Average kg milkfat per cow</i>	<i>Average kg protein per cow</i>	<i>Average kg milksolids per cow</i>
Northland	70,106,363	4.9	886,354	43,161	32,303	75,464	333	249	582	148	110	258
Auckland	30,742,893	2.1	814,590	38,978	29,644	68,623	382	291	673	160	121	281
Waikato	341,479,152	23.7	1,102,657	54,719	40,907	95,626	516	386	901	174	130	305
Bay of Plenty	55,672,467	3.9	1,076,691	52,233	39,184	91,416	468	351	819	165	124	289
Central Plateau	69,397,416	4.8	1,750,563	86,306	64,231	150,537	460	342	802	171	127	298
Western Uplands	10,097,381	0.7	1,414,647	70,167	52,971	123,139	405	306	710	156	117	273
East Coast	1,323,669	0.1	1,150,230	53,470	41,078	94,548	324	249	573	134	103	238
Hawkes Bay	13,874,154	1.0	2,332,930	111,392	86,810	198,202	499	389	889	170	132	302
Taranaki	158,296,734	11.0	985,657	51,647	38,346	89,992	536	398	935	190	141	331
Manawatu	67,807,002	4.7	1,428,690	68,705	52,813	121,518	515	396	911	189	145	334
Wairarapa	54,803,978	3.8	1,315,206	66,073	50,037	116,110	522	395	917	189	143	332
North Island	873,601,209	60.7	1,118,447	55,637	41,722	97,359	482	362	844	174	131	305
Nelson/Marlborough	26,807,294	1.9	1,248,232	63,665	47,569	111,234	513	384	897	185	138	323
West Coast	44,167,917	3.1	1,315,680	68,827	51,194	120,022	392	292	684	176	131	308
North Canterbury	182,326,607	12.7	3,226,506	157,416	123,519	280,935	719	564	1,283	215	169	384
South Canterbury	65,516,933	4.6	3,122,621	151,780	118,951	270,731	696	545	1,241	209	163	372
Otago	73,791,163	5.1	2,321,545	112,239	88,280	200,519	596	469	1,065	208	163	371
Southland	172,285,585	12.0	2,303,559	113,680	89,009	202,689	569	446	1,015	211	165	376
South Island	564,895,499	39.3	2,371,974	116,813	91,022	207,835	601	468	1,069	207	161	368
New Zealand	1,438,496,707	100.0	1,409,875	69,859	53,184	123,043	522	398	920	186	141	327

South Taranaki continues to be the district with the most herds (1,071) followed by Matamata-Piako (1,019). The Southland district has the most cows (346,383), followed by South Taranaki (309,641) (Table 3.3). Hurunui in North Canterbury has the highest average herd size with 848 cows. The next largest is Ashburton, also in North Canterbury, with 827 cows. The number of owner-operators and sharemilkers is now included in table 3.3.

Table 3.3: Herd analysis by district in 2009/10

<i>Region</i>	<i>District</i>	<i>Total herds</i>	<i>Number of owner-operators</i>	<i>Number of share-milkers</i>	<i>Total cows</i>	<i>Total effective hectares</i>	<i>Average herd size</i>	<i>Average effective hectares</i>	<i>Average cows per hectare</i>
Northland	Far North	258	195	62	70,494	32,907	273	128	2.14
	Whangarei	310	220	84	96,807	40,403	312	130	2.40
	Kaipara	361	274	85	104,310	47,070	289	130	2.22
Auckland	Rodney	163	106	57	41,487	18,176	255	112	2.28
	Manukau City	15	6	9	3,912	1,429	261	95	2.74
	Papakura	5	4	1	720	335	144	67	2.15
Waikato	Franklin	265	168	95	63,286	25,732	239	97	2.46
	Waikato	684	416	264	216,279	75,693	316	111	2.86
	Hamilton City	18	9	9	4,589	1,539	255	86	2.98
Bay of Plenty	Waipa	585	382	203	192,613	62,812	329	107	3.07
	Otorohanga	380	239	141	131,350	45,875	346	121	2.86
	Thames-Coromandel	87	58	29	23,647	9,080	272	104	2.60
Central Plateau	Hauraki	412	262	148	113,554	40,691	276	99	2.79
	Matamata-Piako	1,019	587	432	296,661	94,135	291	92	3.15
	South Waikato	386	237	149	141,960	48,971	368	127	2.90
Bay of Plenty	Western Bay of Plenty	202	126	75	68,091	22,819	337	113	2.98
	Tauranga	14	13	1	3,642	1,525	260	109	2.39
	Kawerau/Whakatane	314	214	97	96,762	34,744	308	111	2.78
Central Plateau	Opotiki	79	44	35	24,374	8,898	309	113	2.74
	Taupo	141	96	45	98,952	37,634	702	267	2.63
	Rotorua	320	205	115	133,623	48,946	418	153	2.73
Western Uplands	Waitomo	57	42	15	25,839	10,113	453	177	2.56
	Ruapehu	25	15	10	11,135	4,100	445	164	2.72
East Coast	Gisborne	6	4	2	3,051	1,295	509	216	2.36
	Wairoa	8	7	.	2,520	1,015	315	127	2.48
Hawkes Bay	Napier/Hastings	31	30	1	19,102	6,484	616	209	2.95
	Central Hawkes Bay	39	29	10	26,818	9,127	688	234	2.94
Taranaki	New Plymouth	438	276	162	109,263	41,327	249	94	2.64
	Stratford	250	166	83	59,419	22,403	238	90	2.65
	South Taranaki	1,071	576	489	309,641	105,614	289	99	2.93
Manawatu	Wanganui	21	17	4	8,249	3,162	393	151	2.61
	Rangitikei	88	59	29	36,361	13,003	413	148	2.80
	Manawatu	248	175	73	86,996	32,040	351	129	2.72
Wairarapa	Palmerston North City	58	38	19	19,874	7,426	343	128	2.68
	Horowhenua	120	87	33	45,207	16,215	377	135	2.79
	Kapiti Coast/Upper Hutt	23	20	3	6,162	2,571	268	112	2.40
Wairarapa	Tararua	313	214	99	98,480	36,451	315	116	2.70
	Masterton	18	15	3	8,107	2,866	450	159	2.83
	Carterton	56	48	8	20,701	7,430	370	133	2.79
North Island	South Wairarapa	85	60	25	37,577	13,031	442	153	2.88
		8,973	5,739	3,204	2,861,615	1,035,087	319	115	2.76

(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	60	48	12	17,461	6,306	291	105	2.77
	Kaikoura	27	16	11	10,035	3,491	372	129	2.87
	Tasman / Nelson City	154	128	26	55,623	20,094	361	130	2.77
West Coast	Buller	127	101	26	49,365	21,089	389	166	2.34
	Grey	85	65	20	39,222	16,938	461	199	2.32
	Westland	156	118	36	54,971	26,586	352	170	2.07
North Canterbury	Hurunui	64	47	17	54,301	16,621	848	260	3.27
	Waimakariri	84	60	24	44,960	13,648	535	162	3.29
	Christchurch City	10	7	3	5,962	1,499	596	150	3.98
	Banks Peninsula	10	6	4	2,220	968	222	97	2.29
	Selwyn	193	147	46	129,551	40,197	671	208	3.22
	Ashburton	288	183	105	238,251	69,125	827	240	3.45
South Canterbury	Timaru	132	93	39	90,123	26,295	683	199	3.43
	MacKenzie	13	11	2	9,931	3,807	764	293	2.61
	Waimate	97	62	35	76,031	22,702	784	234	3.35
Otago	Waitaki	112	52	60	73,427	23,294	656	208	3.15
	Dunedin City	64	31	33	23,171	8,797	362	137	2.63
	Clutha	181	106	75	94,440	34,551	522	191	2.73
	Central Otago	11	9	2	7,709	2,651	701	241	2.91
Southland	Gore	143	90	53	76,624	28,710	536	201	2.67
	Invercargill	65	35	30	35,299	12,825	543	197	2.75
	Southland	642	380	262	346,383	128,214	540	200	2.70
South Island		2,718	1,795	921	1,535,060	528,408	565	194	2.91
New Zealand		11,691	7,534	4,125	4,396,675	1,563,495	376	134	2.81

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

Hurunui district has the highest average production per herd with 326,768 kilograms of milksolids (Table 3.4). Christchurch City, Ashburton, and Timaru had the highest average kilograms of milksolids per effective hectare (1,364, 1,327, 1,323 respectively). MacKenzie district recorded the highest production per cow (388 kg of milksolids). The North Island district that has the highest milksolids production per herd is Central Hawkes Bay with an average of 218,771 kilograms of milksolids. On a per-hectare basis and a per-cow basis, Masterton produced the highest average kilograms of milksolids.

Table 3.4: Herd production analysis by district in 2009/10

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	803,846	38,738	29,089	67,828	304	228	532	142	107	248
	Whangarei	956,729	47,690	35,203	82,893	366	270	636	153	113	265
	Kaipara	884,887	42,433	32,109	74,542	325	246	572	147	111	258
Auckland	Rodney	780,526	38,134	28,651	66,785	342	257	599	150	113	262
	Manukau City	902,493	42,593	32,436	75,029	447	340	788	163	124	288
	Papakura	438,625	19,355	15,398	34,753	289	230	519	134	107	241
	Franklin	837,660	39,663	30,366	70,029	408	313	721	166	127	293
Waikato	Waikato	1,092,651	53,358	39,978	93,336	482	361	843	169	126	295
	Hamilton City	908,010	44,603	33,575	78,177	522	393	914	175	132	307
	Waipa	1,206,457	60,132	44,832	104,964	560	418	978	183	136	319
	Otorohanga	1,176,196	58,545	43,808	102,353	485	363	848	169	127	296
	Thames-Coromandel	902,590	44,526	33,289	77,815	427	319	746	164	123	286
	Hauraki	917,566	45,147	33,898	79,045	457	343	800	164	123	287
	Matamata-Piako	1,025,096	51,584	38,412	89,996	558	416	974	177	132	309
	South Waikato	1,347,158	66,421	49,873	116,294	524	393	917	181	136	316
Bay of Plenty	Western Bay of Plenty	1,091,229	54,058	40,141	94,199	479	355	834	160	119	280
	Tauranga	778,196	37,812	28,939	66,752	347	266	613	145	111	257
	Kawerau/Whakatane	1,096,765	52,558	39,557	92,115	475	358	832	171	128	299
	Opotiki	1,012,628	48,829	37,065	85,894	434	329	763	158	120	278
Central Plateau	Taupo	2,346,673	116,457	86,785	203,242	436	325	761	166	124	290
	Rotorua	1,487,901	73,021	54,292	127,313	477	355	832	175	130	305
Western Uplands	Waitomo	1,385,554	68,812	51,878	120,690	388	292	680	152	114	266
	Ruapehu	1,480,980	73,257	55,465	128,722	447	338	785	165	125	289
East Coast	Gisborne	1,413,976	66,878	51,537	118,415	310	239	549	132	101	233
	Wairoa	952,420	43,414	33,233	76,647	342	262	604	138	106	243
Hawkes Bay	Napier/Hastings	2,035,607	97,345	74,981	172,325	465	358	824	158	122	280
	Central Hawkes Bay	2,569,263	122,559	96,212	218,771	524	411	935	178	140	318
Taranaki	New Plymouth	894,172	46,450	34,417	80,867	492	365	857	186	138	324
	Stratford	881,904	45,307	34,040	79,347	506	380	885	191	143	334
	South Taranaki	1,047,291	55,251	40,958	96,209	560	415	976	191	142	333
Manawatu	Wanganui	1,398,865	63,525	50,125	113,650	422	333	755	162	128	289
	Rangitikei	1,693,789	81,983	63,130	145,113	555	427	982	198	153	351
	Manawatu	1,350,469	65,382	49,964	115,345	506	387	893	186	142	329
	Palmerston North City	1,270,672	61,909	47,483	109,392	484	371	854	181	139	319
	Horowhenua	1,555,255	74,112	57,225	131,337	548	423	972	197	152	349
	Kapiti Coast/Upper Hutt	1,023,204	47,398	36,933	84,332	424	330	754	177	138	315
Wairarapa	Tararua	1,157,377	59,099	44,297	103,396	507	380	888	188	141	329
	Masterton	1,944,492	94,433	72,876	167,309	593	458	1,051	210	162	372
	Carterton	1,452,232	70,809	54,387	125,196	534	410	944	192	147	339
	South Wairarapa	1,672,854	82,628	63,471	146,100	539	414	953	187	144	331
North Island		1,118,447	55,637	41,722	97,359	482	362	844	175	131	305

(table 3.4 continued)

Region	District	Average litres per herd	Average kg milkfat per herd	Average kg protein per herd	Average kg milk solids per herd	Average kg milkfat per effective hectare	Average kg protein per effective hectare	Average kg milk solids per effective hectare	Average kg milkfat per cow	Average kg protein per cow	Average kg milk solids per cow
Nelson/Marlborough	Marlborough	1,053,419	52,862	39,704	92,566	503	378	881	182	136	318
	Kaikoura	1,514,341	75,630	57,219	132,849	585	443	1,027	204	154	357
	Tasman/Nelson City	1,277,477	65,776	48,941	114,717	504	375	879	182	136	318
West Coast	Buller	1,296,250	66,706	49,747	116,453	402	300	701	172	128	300
	Grey	1,642,693	84,874	63,910	148,784	426	321	747	184	139	322
	Westland	1,153,318	61,811	45,444	107,255	363	267	629	175	129	304
North Canterbury	Hurunui	3,781,922	182,906	143,861	326,768	704	554	1,258	216	170	385
	Waimakariri	2,391,501	113,997	90,336	204,332	702	556	1,258	213	169	382
	Christchurch City	2,379,591	114,656	89,870	204,526	765	600	1,364	192	151	343
	Banks Peninsula	933,116	44,145	34,456	78,602	456	356	812	199	155	354
	Selwyn	2,954,623	144,626	112,867	257,493	694	542	1,236	216	168	384
	Ashburton	3,637,862	178,404	140,075	318,480	743	584	1,327	216	169	385
South Canterbury	Timaru	3,065,633	147,068	116,496	263,564	738	585	1,323	215	171	386
	MacKenzie	3,385,375	167,300	129,056	296,356	571	441	1,012	219	169	388
	Waimate	3,164,957	156,112	120,938	277,050	667	517	1,184	199	154	354
Otago	Waitaki	2,847,434	138,288	107,875	246,163	665	519	1,184	211	165	376
	Dunedin City	1,642,739	77,925	61,613	139,537	567	448	1,015	215	170	385
	Clutha	2,210,435	106,542	84,419	190,962	558	442	1,000	204	162	366
	Central Otago	2,744,713	140,407	107,454	247,860	583	446	1,028	200	153	354
Southland	Gore	2,202,060	107,710	84,308	192,018	536	420	956	201	157	358
	Invercargill	2,351,138	115,309	90,815	206,124	584	460	1,045	212	167	380
	Southland	2,321,350	114,845	89,873	204,718	575	450	1,025	213	167	379
South Island		2,371,974	116,813	91,022	207,835	601	468	1,069	207	161	368
New Zealand		1,409,875	69,859	53,184	123,043	522	398	920	186	141	327

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

- *Use of herd testing declined markedly in 2009/10*

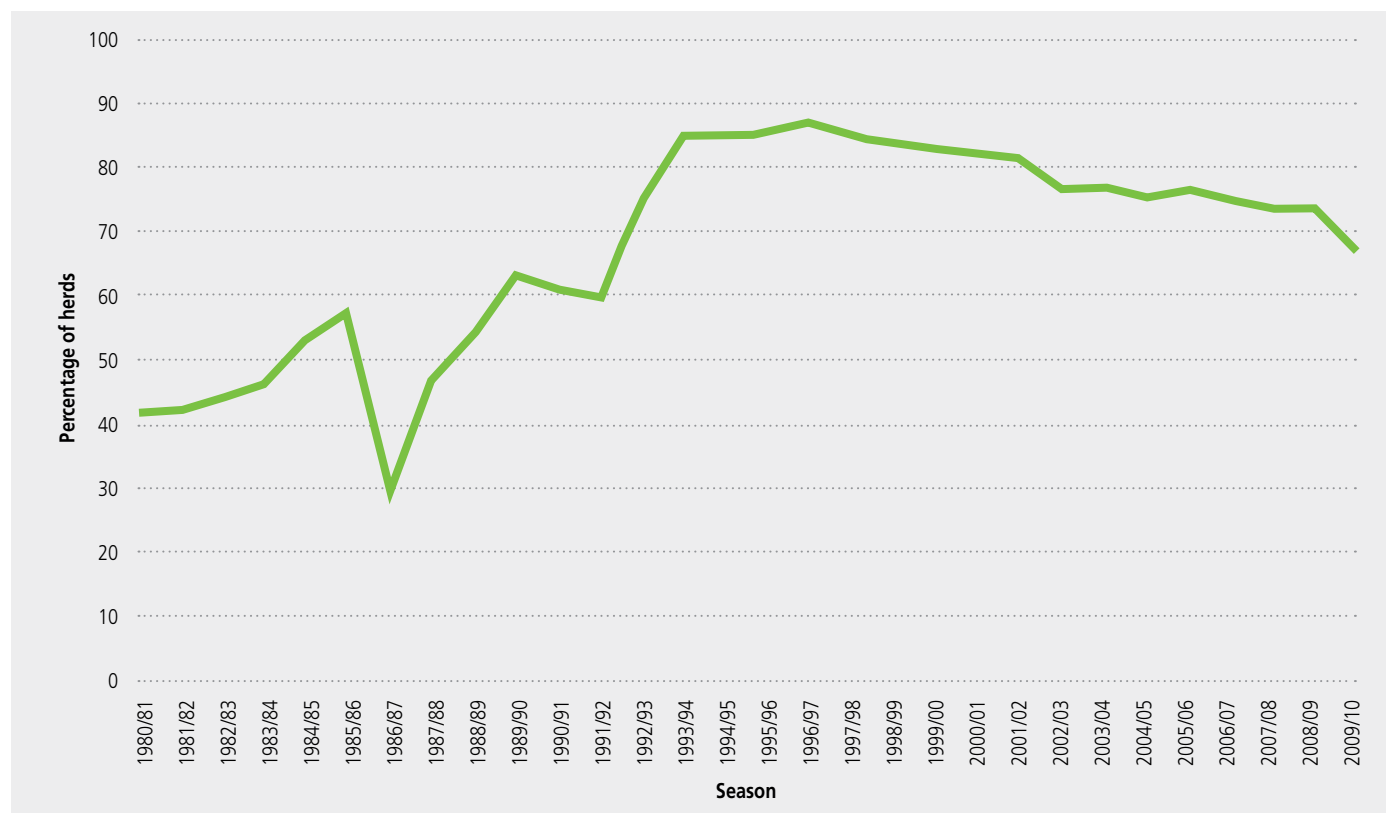
The percentage of total herds and the percentage of total cows using herd testing dropped markedly in 2009/10 (67.2% and 63.8% respectively, Table 4.1), probably as a result of an expected low milk price at the start of the 2009/10 season. 2.8 million cows were herd-tested in 2009/10 compared with the record number herd-tested in 2008/09 (over 3 million).

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)
1990/91	8,918	60.7	1,566	65.2	14,685	2,402
1991/92	8,661	59.9	1,611	66.1	14,452	2,439
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	7,854	67.2	2,805	63.8	11,691	4,397

The trend in the percentage of total herds using herd testing shows the marked decline in 2009/10 compared with the gradual decline since the mid 1990s (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 2009/10 is shown in Table 4.2, where the number of cows tested refers to all cows tested at least once in the season. Wairarapa had the highest percentage of herds using herd testing (76%) whereas Taranaki reported the highest percentage of cows herd testing (77%). The Central Plateau recorded the lowest percentage of cows herd tested (44%).

Table 4.2: Use of herd testing by region in 2009/10

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	601	929	64.7	181,876	271,611	67.0	303	292
Auckland	316	448	70.5	80,403	109,405	73.5	254	244
Waikato	2,461	3,571	68.9	766,550	1,120,653	68.4	311	314
Bay of Plenty	426	609	70.0	131,116	192,869	68.0	308	317
Central Plateau	226	461	49.0	101,680	232,575	43.7	450	505
Western Uplands	49	82	59.8	20,520	36,974	55.5	419	451
East Coast	9	14	64.3	3,186	5,571	57.2	354	398
Hawkes Bay	38	70	54.3	26,588	45,920	57.9	700	656
Taranaki	1,334	1,759	75.8	366,794	478,323	76.7	275	272
Manawatu	377	558	67.6	134,924	202,849	66.5	358	364
Wairarapa	360	472	76.3	117,909	164,865	71.5	328	349
Nelson/Marlborough	181	241	75.1	55,810	83,119	67.1	308	345
West Coast	236	368	64.1	82,645	143,558	57.6	350	390
North Canterbury	417	649	64.3	300,723	475,245	63.3	721	732
South Canterbury	127	242	52.5	88,676	176,085	50.4	698	728
Otago	244	368	66.3	124,858	198,747	62.8	512	540
Southland	468	850	55.1	227,915	458,306	49.7	487	539
New Zealand	7,870	11,691	67.3	2,812,173	4,396,675	64.0	357	376

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. Season and breed averages (parts i and iii) are calculated on lactation yields for herds tested four or more times during the season. Monthly averages (part ii) are calculated on lactation yields for herds tested at least once during the season, and only cows that lactated for 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) Season averages

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

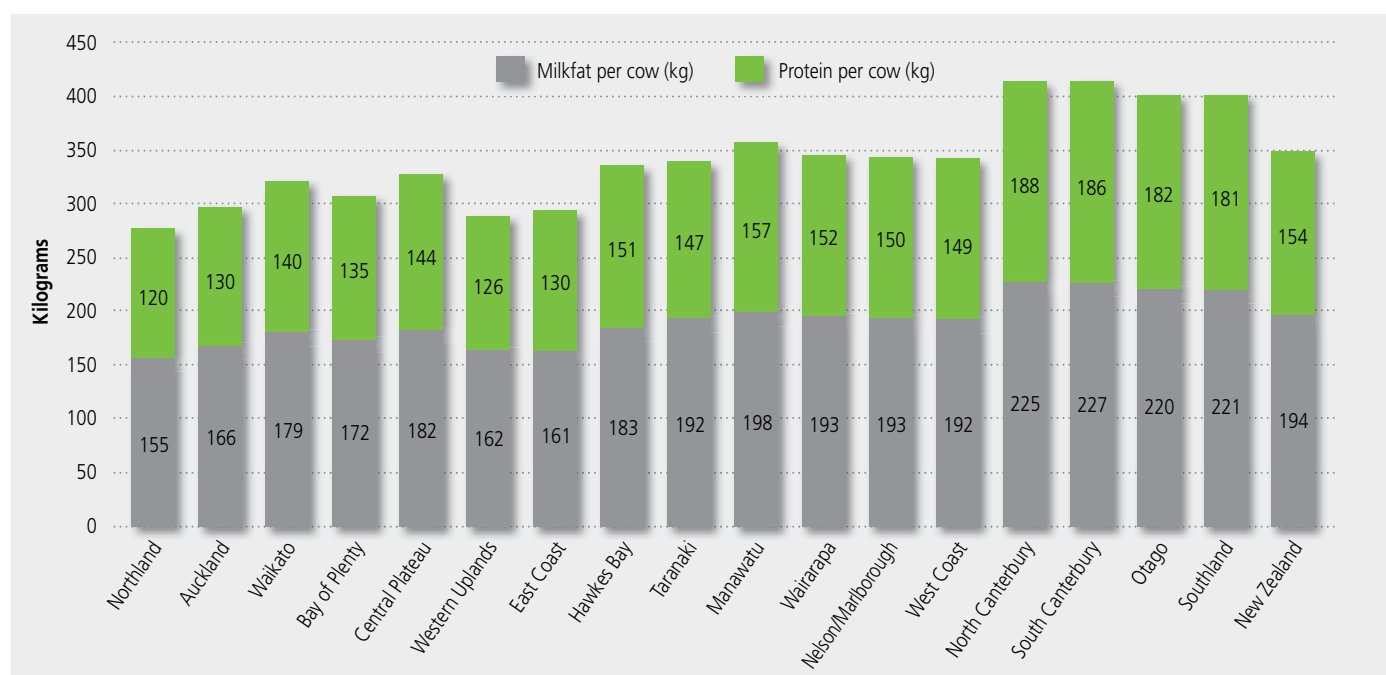
The average per-cow statistics for each region are summarised in Table 4.3. North Canterbury recorded the highest per cow milk volume (4,970 litres) and protein (188 kg), with South Canterbury recording the highest milkfat (227 kg), of cows herd tested. Taranaki recorded the highest percentage for milkfat (5.07%), protein (3.89%), and milksolids (8.96%), due to having a larger proportion of Jersey cows.

Table 4.3: Season herd test averages per cow by region in 2009/10

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)	days in milk (prod) raw
Northland	3,306	155	4.68	120	3.64	275	8.32	213	248	271	264
Auckland	3,612	166	4.59	130	3.60	296	8.19	218	250	247	266
Waikato	3,770	179	4.76	140	3.71	319	8.47	225	254	215	270
Bay of Plenty	3,712	172	4.64	135	3.64	307	8.28	218	254	246	270
Central Plateau	3,970	182	4.58	144	3.64	326	8.21	216	253	237	269
Western Uplands	3,411	162	4.74	126	3.70	288	8.44	222	258	240	274
East Coast	3,659	161	4.41	130	3.56	292	7.97	216	264	319	280
Hawkes Bay	4,155	183	4.41	151	3.64	335	8.05	233	270	272	286
Taranaki	3,782	192	5.07	147	3.89	339	8.96	226	262	226	278
Manawatu	4,320	198	4.58	157	3.64	355	8.23	235	272	266	288
Wairarapa	4,024	193	4.80	152	3.78	345	8.58	228	270	251	286
Nelson/Marlborough	3,969	193	4.86	150	3.77	342	8.63	229	266	236	282
West Coast	3,855	192	4.97	149	3.88	341	8.85	227	265	233	281
North Canterbury	4,970	225	4.54	188	3.78	413	8.31	237	276	240	292
South Canterbury	4,942	227	4.59	186	3.77	413	8.35	236	270	246	286
Otago	4,787	220	4.60	182	3.80	402	8.40	235	268	239	284
Southland	4,709	221	4.69	181	3.84	401	8.52	231	268	231	284
New Zealand	4,097	194	4.73	154	3.76	348	8.48	227	260	235	276

The 2009/10 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 155 (Northland) to 227 kg per cow (South Canterbury) and protein production from 120 (Northland) to 188 kg per cow (North Canterbury).

Graph 4.2: Average milkfat and protein production per cow in 2009/10



• **Production per cow (kg) improves on previous season**

The last 20 seasons have seen a general trend of increasing production in both milk volume and milksolids. However, other factors, such as weather conditions, can cause season-to-season variation. The 1998/99 season recorded 260kg milksolids per cow, the lowest in more than 10 years (Table 4.4).

The sharp decrease in the average somatic cell count per millilitre of milk from 1993/94 onward, compared to the seasons prior to this, (as shown in Table 4.4), is due to a number of factors including industry pressure for improved milk quality, and changes to farm management practices. The steady upward trend that has appeared over the last few seasons may be commencing a decline.

Average days in milk has been consistent during the last six years, with the exception of the widespread drought in 2007/08 when days in milk fell to 252.

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)
1990/91	3,190	152	4.81	116	3.65	268	8.40	222	-	298
1991/92	3,361	162	4.83	124	3.70	286	8.51	226	-	282
1992/93	3,298	157	4.77	121	3.65	278	8.43	221	-	280
1993/94	3,560	171	4.84	131	3.69	302	8.48	223	-	216
1994/95	3,253	154	4.77	118	3.64	272	8.36	208	-	206
1995/96	3,501	164	4.72	126	3.60	290	8.28	224	-	206
1996/97	3,641	173	4.78	133	3.66	306	8.40	223	-	197
1997/98	3,373	158	4.67	119	3.52	277	8.21	209	266	195
1998/99	3,189	147	4.51	113	3.44	260	8.15	208	266	200
1999/00	3,601	169	4.69	130	3.58	299	8.30	221	263	193
2000/01	3,706	173	4.68	134	3.59	307	8.28	224	268	196
2001/02	3,791	176	4.64	138	3.61	314	8.28	227	268 ^a	210
2002/03	3,736	175	4.68	138	3.66	313	8.38	219	-	213
2003/04	3,871	184	4.75	142	3.64	326	8.42	224	265	220
2004/05	3,812	181	4.75	140	3.66	321	8.42	225	265	229
2005/06	3,951	186	4.72	146	3.68	332	8.40	227	266	213
2006/07	4,014	191	4.85	150	3.76	341	8.50	230	267	232
2007/08	3,987	187	4.68	148	3.70	334	8.38	225	252	246
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

- Not available

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

ii) Monthly averages

• Highest average production per cow per day occurred in September

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

Table 4.5: Monthly herd test averages by region in 2009/10

Average litres of milk per cow per day

<i>Farming region</i>	<i>2009 Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>2010 Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Season average</i>
Northland	15.31	14.00	18.34	19.40	18.33	16.54	14.73	11.49	10.78	9.64	9.41	13.61	14.57
Auckland	14.75	16.38	18.29	20.25	19.07	17.66	16.22	12.93	11.72	9.56	9.06	13.29	15.41
Waikato	15.57	16.69	19.97	21.51	19.47	18.41	16.58	14.40	13.55	10.60	8.82	12.84	15.98
Bay of Plenty	12.30		21.22	22.24	19.81	19.08	17.14	13.17	13.93	10.74	8.49	9.11	16.31
Central Plateau			23.75	22.11	21.23	20.99	19.41	14.55	15.82	12.47	9.91	17.60	17.15
Western Uplands				18.64	19.20	15.34	16.87	15.76	12.91	11.82	7.46	9.08	14.78
East Coast	19.03		23.31	21.40	19.35	17.76	20.54	12.81	13.74	11.55			16.31
Hawkes Bay	19.79	12.92	22.20	21.21	21.36	19.08	18.49	12.96	15.31	13.01	12.37	11.87	16.65
Taranaki	14.32	16.20	20.08	20.73	19.62	18.40	16.46	15.35	13.81	11.42	9.70	11.08	15.74
Manawatu	15.35	16.09	20.46	22.45	20.98	20.09	18.37	16.52	15.55	12.74	10.97	13.31	17.15
Wairarapa	12.42	14.81	18.76	21.60	21.14	19.91	17.80	16.17	15.42	13.12	10.49	11.66	16.64
Nelson/Marlborough	18.11		19.88	21.10	21.51	19.97	18.20	16.42	14.36	12.53	10.60	10.32	16.48
West Coast			18.57	21.40	21.10	19.76	17.54	14.95	14.40	12.74	10.50	9.70	15.86
North Canterbury	18.34	18.07	19.56	24.48	24.87	23.50	22.02	19.21	18.39	15.74	14.28	14.43	19.85
South Canterbury	17.86	21.75	19.75	24.49	25.25	24.34	21.70	19.70	17.92	15.86	14.11	15.64	20.06
Otago	19.17	19.70	21.95	24.38	24.43	24.05	20.63	19.69	17.60	15.33	12.08	11.79	19.16
Southland	15.02	15.51	21.19	24.49	24.77	22.87	21.54	18.99	18.51	15.47	12.32	11.81	19.14
New Zealand¹	15.57	16.20	19.75	21.86	21.33	19.74	18.24	15.51	15.05	12.28	11.12	12.72	16.95

Average kg of milkfat per cow per day

<i>Farming region</i>	<i>2009 Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>2010 Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Season average</i>
Northland	0.72	0.66	0.83	0.88	0.84	0.78	0.68	0.58	0.56	0.56	0.55	0.68	0.72
Auckland	0.65	0.72	0.82	0.89	0.87	0.82	0.75	0.63	0.59	0.54	0.53	0.68	0.74
Waikato	0.74	0.82	0.96	0.98	0.97	0.87	0.79	0.71	0.70	0.62	0.55	0.72	0.80
Bay of Plenty	0.72		0.96	0.98	0.90	0.87	0.79	0.66	0.69	0.60	0.53	0.51	0.80
Central Plateau			1.13	0.97	0.96	0.94	0.87	0.72	0.76	0.68	0.59	0.98	0.83
Western Uplands				0.86	0.88	0.73	0.79	0.74	0.65	0.62	0.47	0.51	0.74
East Coast	0.91		0.86	0.91	0.74	0.73	0.90	0.60	0.61	0.62			0.74
Hawkes Bay	0.97	0.62	0.97	0.93	0.90	0.82	0.80	0.59	0.73	0.64	0.65	0.58	0.77
Taranaki	0.76	0.86	1.01	1.00	0.96	0.92	0.85	0.81	0.75	0.69	0.63	0.68	0.85
Manawatu	0.74	0.75	0.91	0.99	0.95	0.91	0.84	0.77	0.74	0.68	0.62	0.72	0.82
Wairarapa	0.68	0.70	0.86	0.98	0.99	0.94	0.87	0.80	0.78	0.73	0.63	0.67	0.85
Nelson/Marlborough	0.93		0.97	0.98	1.00	0.95	0.89	0.82	0.75	0.72	0.63	0.64	0.85
West Coast			0.90	0.98	0.99	0.98	0.90	0.78	0.76	0.74	0.66	0.63	0.85
North Canterbury	0.88	0.85	0.91	1.07	1.11	1.04	1.01	0.90	0.88	0.81	0.78	0.78	0.95
South Canterbury	0.87	0.92	0.79	1.08	1.10	1.08	0.99	0.94	0.85	0.83	0.78	0.84	0.96
Otago	0.92	0.90	0.95	1.08	1.08	1.08	0.97	0.91	0.86	0.79	0.70	0.69	0.94
Southland	0.81	0.81	1.07	1.12	1.12	1.07	1.01	0.90	0.90	0.82	0.71	0.70	0.95
New Zealand¹	0.75	0.77	0.92	0.99	0.98	0.93	0.87	0.77	0.76	0.69	0.66	0.72	0.85

Average kg of protein per cow per day

Farming region	2009							2010					Season average
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
Northland	0.56	0.51	0.67	0.71	0.67	0.62	0.53	0.42	0.41	0.40	0.40	0.51	0.55
Auckland	0.52	0.56	0.66	0.74	0.69	0.65	0.60	0.47	0.44	0.39	0.38	0.51	0.57
Waikato	0.58	0.63	0.74	0.80	0.71	0.69	0.62	0.54	0.51	0.44	0.39	0.54	0.61
Bay of Plenty	0.57		0.77	0.81	0.71	0.70	0.62	0.48	0.52	0.44	0.38	0.40	0.61
Central Plateau			0.90	0.81	0.77	0.77	0.70	0.53	0.59	0.51	0.43	0.74	0.65
Western Uplands				0.68	0.70	0.58	0.62	0.58	0.49	0.46	0.34	0.38	0.57
East Coast	0.67		0.78	0.79	0.60	0.60	0.74	0.46	0.46	0.45			0.58
Hawkes Bay	0.74	0.49	0.81	0.80	0.77	0.70	0.67	0.47	0.58	0.51	0.52	0.48	0.63
Taranaki	0.57	0.64	0.76	0.79	0.74	0.72	0.65	0.61	0.55	0.49	0.44	0.50	0.64
Manawatu	0.56	0.59	0.73	0.82	0.76	0.73	0.67	0.61	0.58	0.51	0.46	0.55	0.65
Wairarapa	0.49	0.55	0.70	0.81	0.79	0.75	0.68	0.61	0.60	0.54	0.47	0.49	0.65
Nelson/Marlborough	0.64		0.73	0.79	0.80	0.74	0.68	0.62	0.56	0.53	0.47	0.46	0.65
West Coast			0.75	0.81	0.81	0.77	0.68	0.58	0.57	0.54	0.48	0.47	0.64
North Canterbury	0.69	0.66	0.71	0.90	0.92	0.88	0.83	0.74	0.72	0.65	0.62	0.63	0.78
South Canterbury	0.66	0.82	0.68	0.90	0.93	0.90	0.81	0.75	0.69	0.66	0.61	0.68	0.78
Otago	0.69	0.70	0.80	0.90	0.90	0.90	0.78	0.74	0.70	0.63	0.54	0.53	0.76
Southland	0.62	0.60	0.81	0.93	0.92	0.87	0.83	0.73	0.73	0.65	0.55	0.53	0.76
New Zealand ¹	0.58	0.60	0.73	0.81	0.79	0.74	0.69	0.59	0.58	0.51	0.49	0.55	0.66

Average somatic cell count (000 cells per millilitre)

	2009							2010				Season	
Farming region	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	average
Northland	258	273	230	206	238	217	249	310	337	338	399	321	271
Auckland	303	225	233	212	210	195	236	244	267	342	378	266	247
Waikato	297	297	222	186	182	168	187	204	235	272	350	289	215
Bay of Plenty	342		262	217	209	200	231	257	274	286	381	386	246
Central Plateau			402	194	199	177	210	217	265	288	342	318	237
Western Uplands				216	216	191	176	241	229	303	345	241	239
East Coast	271		225	392	170	234	320	390	274	327			319
Hawkes Bay	318	279	271	258	206	230	231	271	287	341	338	306	272
Taranaki	380	415	301	193	199	187	208	207	249	261	305	322	226
Manawatu	291	306	271	229	234	238	247	271	282	285	320	320	266
Wairarapa	353	347	247	220	224	215	226	246	258	269	305	326	250
Nelson/Marlborough	238		299	233	196	200	197	240	255	281	264	321	236
West Coast			281	204	185	195	206	259	236	269	271	328	233
North Canterbury	334	402	349	230	226	220	242	240	235	253	252	266	240
South Canterbury	324	355	302	256	220	245	218	248	240	263	243	307	246
Otago	378	269	350	241	202	204	229	223	257	260	274	268	239
Southland	408	392	361	223	206	215	203	238	234	240	256	272	231
New Zealand ¹	299	317	245	206	205	196	214	232	251	273	298	289	235

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

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 2009/10

Holstein-Friesian

Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	171,145	219	3,419	151.0	123.8	274.9	4.47	3.63	8.10
3	137,329	213	4,031	173.4	146.3	319.6	4.35	3.64	7.99
4	127,954	213	4,433	191.6	161.2	352.7	4.37	3.64	8.01
5	106,692	212	4,571	198.3	165.4	363.7	4.38	3.63	8.01
6	87,143	212	4,593	198.7	165.4	364.1	4.37	3.61	7.98
7	75,271	210	4,480	196.6	160.7	357.2	4.43	3.60	8.03
8	62,348	208	4,375	193.6	156.5	350.1	4.46	3.59	8.05
9	40,313	206	4,268	184.5	151.0	335.5	4.36	3.55	7.91
10+	48,719	200	3,859	166.0	135.3	301.3	4.34	3.52	7.86
Total	856,914	212	4,159	180.9	150.0	330.9	4.40	3.62	8.02

Jersey

Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	60,447	219	2,466	140.1	100.7	240.8	5.71	4.09	9.80
3	52,630	215	2,869	163.9	119.6	283.5	5.74	4.18	9.92
4	50,027	216	3,152	181.2	131.9	313.1	5.77	4.19	9.96
5	40,140	215	3,245	184.5	134.7	319.2	5.72	4.16	9.88
6	35,012	215	3,198	182.6	133.3	315.9	5.74	4.18	9.92
7	28,609	212	3,131	179.2	129.8	309.0	5.75	4.16	9.91
8	22,213	211	3,072	175.6	126.7	302.3	5.74	4.14	9.88
9	15,768	210	3,034	170.2	123.6	293.8	5.63	4.08	9.71
10+	20,072	204	2,786	156.2	113.4	269.7	5.62	4.08	9.70
Total	324,918	214	2,959	168.7	122.5	291.2	5.72	4.15	9.87

Holstein-Friesian/Jersey crossbreed

Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	189,549	219	3,051	152.6	117.6	270.2	5.06	3.87	8.93
3	145,722	215	3,621	177.7	140.5	318.3	4.96	3.89	8.85
4	127,362	214	3,966	195.2	154.1	349.3	4.98	3.90	8.88
5	101,029	214	4,120	202.2	158.8	361.0	4.96	3.87	8.83
6	85,828	214	4,130	202.2	159.1	361.4	4.95	3.87	8.82
7	68,749	212	4,063	200.9	155.9	356.8	4.99	3.85	8.84
8	52,573	211	3,970	197.8	151.9	349.7	5.03	3.84	8.87
9	34,508	209	3,883	190.4	147.0	337.4	4.95	3.80	8.75
10+	40,563	203	3,496	172.3	132.3	304.5	4.96	3.80	8.76
Total	845,883	214	3,719	183.5	143.3	326.9	4.99	3.87	8.86

Ayrshire

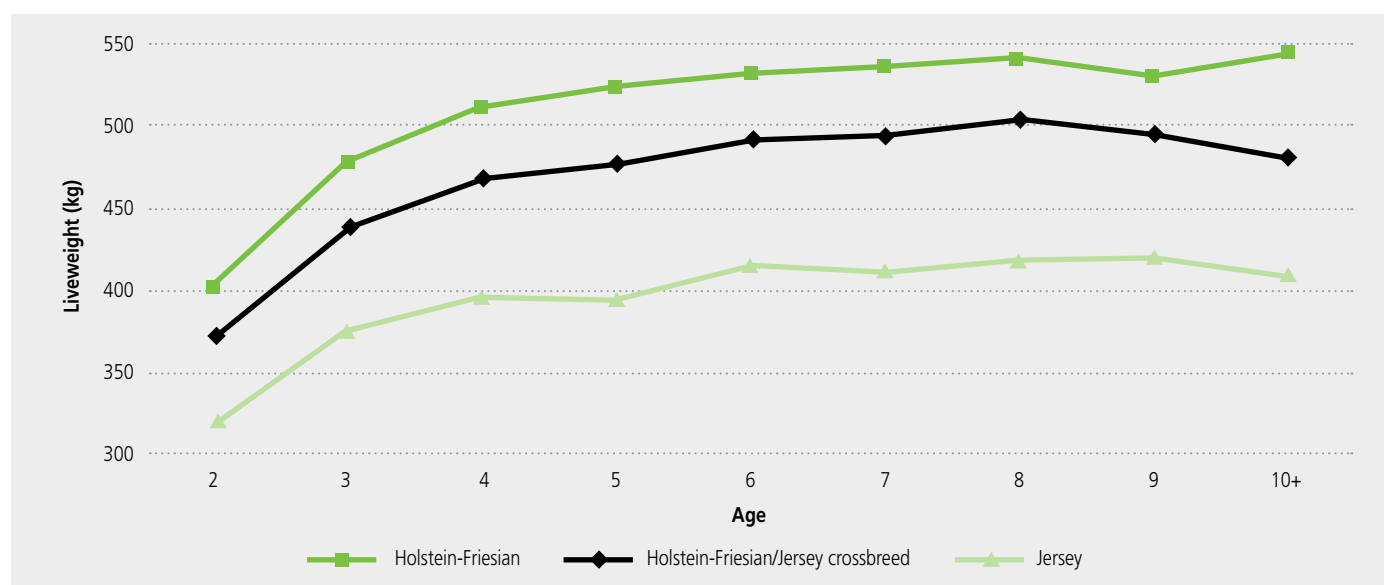
Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milksolids (kg)	Milkfat (%)	Protein (%)	Milksolids (%)
2	3,355	226	3,101	137.2	111.2	248.3	4.45	3.59	8.04
3	2,751	220	3,546	155.5	128.4	284.0	4.41	3.62	8.03
4	2,643	222	3,890	171.4	141.7	313.1	4.43	3.64	8.07
5	2,252	220	3,980	173.4	144.3	317.7	4.38	3.63	8.01
6	1,837	220	4,011	175.0	145.5	320.5	4.37	3.63	8.00
7	1,667	217	3,963	172.6	143.0	315.6	4.38	3.61	7.99
8	1,294	219	3,999	172.7	143.9	316.6	4.34	3.61	7.95
9	976	215	3,777	163.8	135.7	299.4	4.36	3.60	7.96
10+	1,421	210	3,585	153.8	127.4	281.3	4.30	3.56	7.86
Total	18,196	220	3,700	161.7	133.6	295.3	4.39	3.61	8.00

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

Table 4.7: Liveweight by age and breed of cow in 2009/10

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	400	11,921	319	3,840	370	16,570
3	479	1,397	375	574	437	2,062
4	512	1,259	396	437	467	1,390
5	525	1,052	393	419	477	1,039
6	532	802	414	307	490	1,020
7	535	575	412	212	494	712
8	540	467	417	188	503	569
9	531	321	419	150	495	323
10+	542	341	409	147	481	286
All age groups	495		385		450	

Graph 4.3: Liveweight by age and breed of cow in 2009/10



C. Artificial Breeding (AB) statistics

• 3.15 million cows to AB for 2009/10

All artificial inseminations are recorded on the LIC National Database. Table 4.8 provides a summary of cows mated to AB for the last nine seasons. This is the eighth consecutive season where the percentage of cows to AB is below 80% (Graph 4.4). The number of yearlings to AB declined by 25% to 119,487 from the previous season (Table 4.8).

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

Cows to AB

Region	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Northland	215,605	201,193	188,121	182,339	176,370	172,786	175,082	171,472	168,427
Auckland	100,258	90,738	88,658	86,109	81,693	75,613	75,624	73,708	70,604
Waikato	863,863	840,885	828,009	831,809	802,112	810,022	831,945	816,985	803,113
Bay of Plenty	152,959	149,484	145,855	141,484	141,621	143,911	146,265	142,908	135,087
Central Plateau	132,728	126,700	122,990	120,001	116,980	121,672	127,817	129,853	128,561
Western Uplands	19,658	18,951	17,533	18,337	17,370	19,455	20,522	21,781	20,508
East Coast	1,372	985	1,091	612	686	514	1,466	3,163	1,343
Hawkes Bay	22,839	23,651	22,047	22,469	23,896	25,703	27,561	29,426	28,480
Taranaki	419,296	402,943	398,026	388,247	380,806	371,923	390,732	381,876	379,318
Manawatu	147,449	147,363	139,932	137,124	140,106	138,647	140,265	138,830	131,907
Wairarapa	125,511	123,842	121,406	120,794	124,159	121,840	126,863	129,383	124,670
Nelson/Marlborough	70,533	69,211	68,303	67,261	67,119	65,909	65,512	67,270	64,028
West Coast	79,540	78,822	87,566	91,417	94,924	98,435	99,874	103,470	98,785
North Canterbury	203,346	225,000	235,999	247,379	261,166	278,983	313,423	365,250	374,378
South Canterbury	62,883	70,735	77,643	77,693	82,519	91,096	102,486	128,466	130,043
Otago	112,172	116,758	118,463	119,109	122,572	128,254	140,696	147,975	158,855
Southland	216,415	225,756	235,526	228,930	229,360	239,914	268,036	315,849	334,520
New Zealand	2,946,427	2,913,017	2,897,168	2,881,114	2,863,459	2,904,677	3,054,169	3,167,665	3,152,627

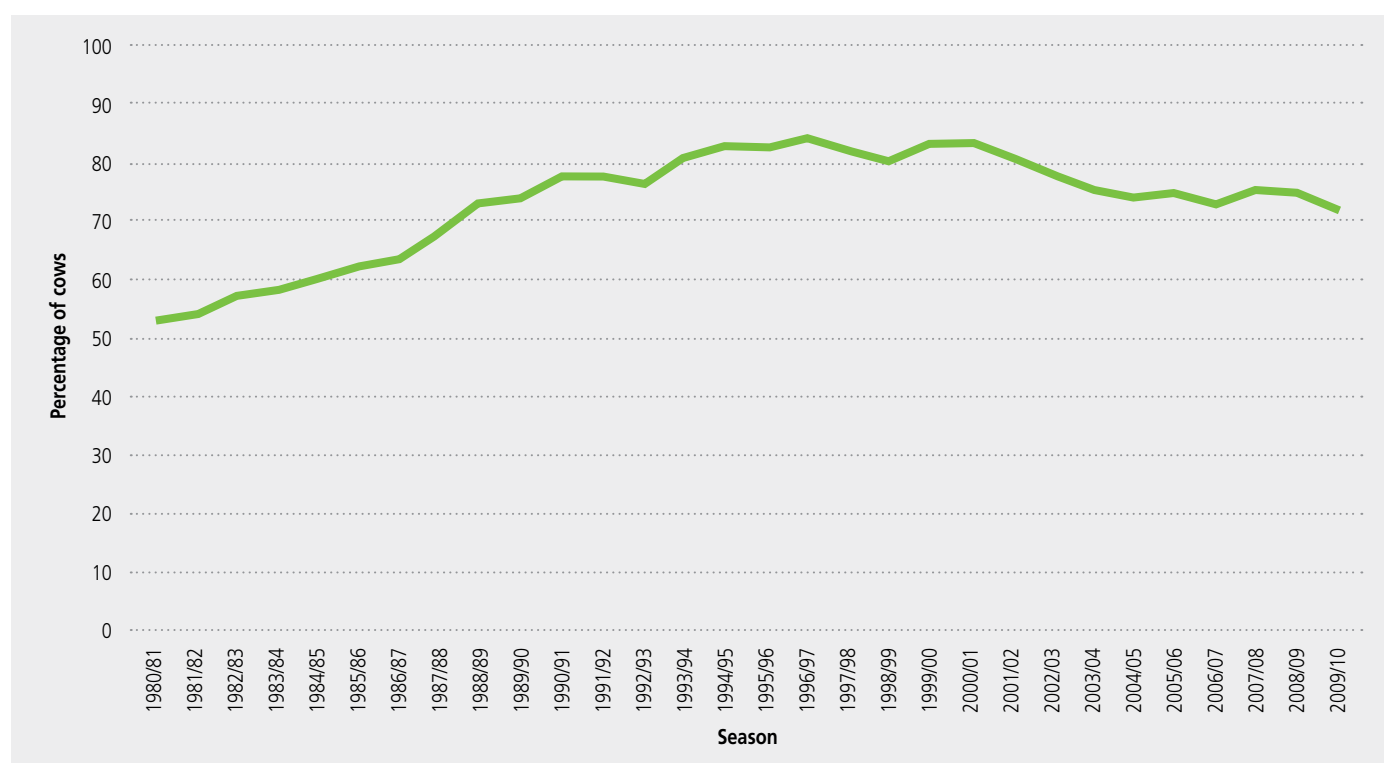
% Cows to AB

Region	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Northland	71.9	68.0	64.4	64.0	65.8	65.0	66.2	64.0	62.0
Auckland	71.0	66.4	65.8	67.4	68.6	65.0	66.9	64.9	64.5
Waikato	80.5	78.6	75.8	76.5	74.6	74.8	77.2	74.0	71.7
Bay of Plenty	81.5	80.6	76.3	75.0	75.9	75.5	76.4	73.9	70.0
Central Plateau	68.6	64.3	60.4	58.5	58.1	58.7	59.7	58.2	55.3
Western Uplands	80.1	72.5	65.4	64.1	61.3	63.9	64.1	63.8	55.5
East Coast	33.9	28.7	25.9	12.1	11.9	12.2	37.7	76.7	24.1
Hawkes Bay	73.9	77.5	62.5	62.5	66.9	68.9	74.7	67.8	62.0
Taranaki	83.7	83.2	80.6	78.8	79.1	77.6	82.3	80.3	79.3
Manawatu	78.7	77.4	74.0	73.1	77.9	73.2	73.7	70.2	65.0
Wairarapa	78.1	76.7	75.0	75.3	79.5	76.7	80.0	78.4	75.6
Nelson/Marlborough	84.5	83.2	79.9	79.0	80.1	81.1	80.8	82.3	77.0
West Coast	80.9	78.2	75.8	73.9	76.6	77.2	75.3	74.0	68.8
North Canterbury	86.7	88.1	82.8	81.3	80.3	80.0	81.0	82.1	78.8
South Canterbury	83.9	84.3	84.6	79.4	77.2	76.9	78.4	78.3	73.9
Otago	82.0	80.7	80.7	78.2	80.1	79.7	82.5	81.1	79.9
Southland	83.2	77.5	78.3	76.3	75.8	75.3	75.9	75.5	73.0
New Zealand	79.8	77.9	75.2	74.5	74.7	74.2	76.1	74.5	71.7

Yearlings to AB

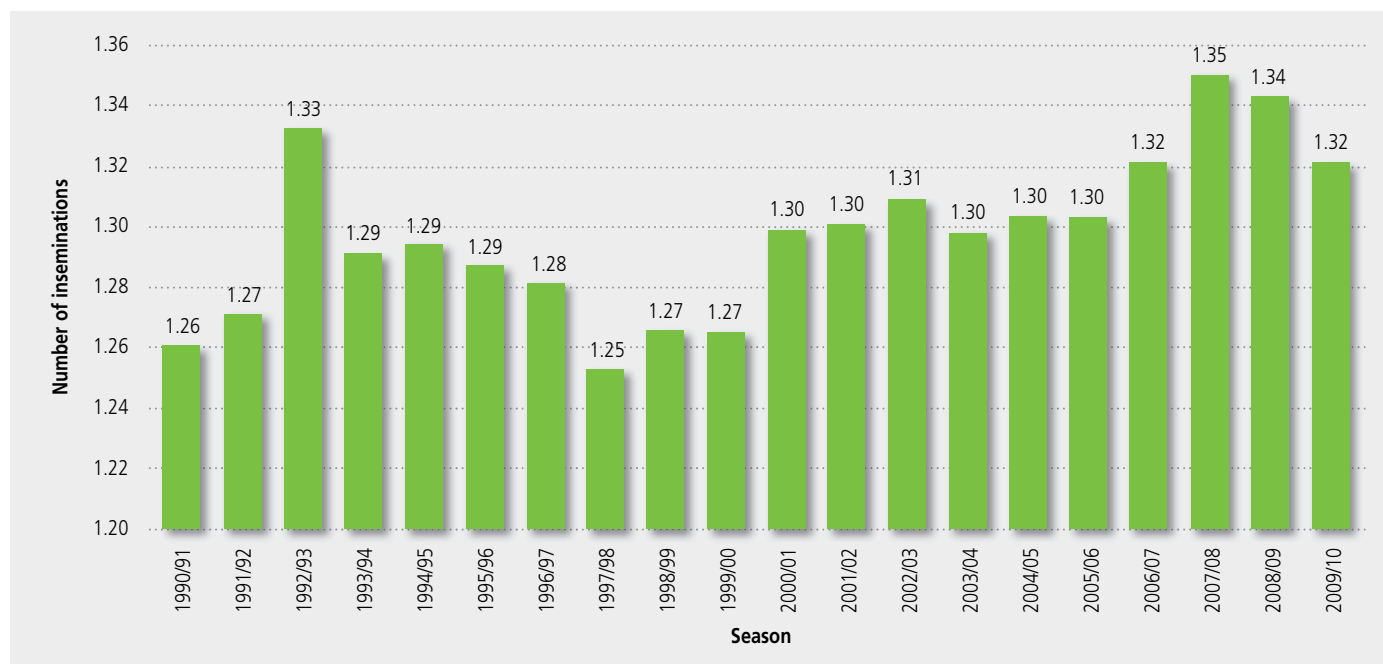
Region	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Northland	9,390	7,153	6,897	6,333	7,334	8,533	11,759	10,796	8,816
Auckland	3,229	2,421	1,900	2,075	2,420	2,338	3,454	3,336	2,588
Waikato	19,726	15,887	13,893	13,933	13,312	16,126	22,341	22,557	15,505
Bay of Plenty	9,066	6,889	4,711	5,027	6,696	7,723	11,508	10,495	7,116
Central Plateau	3,265	2,554	1,849	1,862	2,008	3,374	4,811	3,944	2,917
Western Uplands	859	633	616	637	655	550	1,141	853	782
East Coast	1	0	43	0	0	0	29	3	7
Hawkes Bay	1,306	862	694	872	968	1,042	1,417	2,037	1,010
Taranaki	7,567	5,314	3,692	3,268	3,375	3,420	8,227	6,775	4,822
Manawatu	3,517	2,952	2,211	2,690	3,553	3,205	6,423	6,215	4,137
Wairarapa	2,710	2,270	2,260	2,409	2,850	3,357	5,091	5,044	4,150
Nelson/Marlborough	3,098	2,907	2,142	2,175	3,088	3,522	5,096	4,651	2,499
West Coast	2,665	1,788	1,794	1,739	1,747	1,981	3,658	4,265	3,580
North Canterbury	13,005	11,614	10,177	11,085	16,653	17,920	32,205	25,831	18,911
South Canterbury	8,677	8,826	6,971	7,096	9,193	9,750	14,020	14,669	11,395
Otago	10,025	9,079	5,903	6,545	8,201	10,225	14,767	13,599	13,043
Southland	18,776	13,616	12,606	11,535	14,302	25,160	25,358	25,210	18,209
New Zealand	116,882	94,765	78,359	79,281	96,355	118,226	171,305	160,280	119,487

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



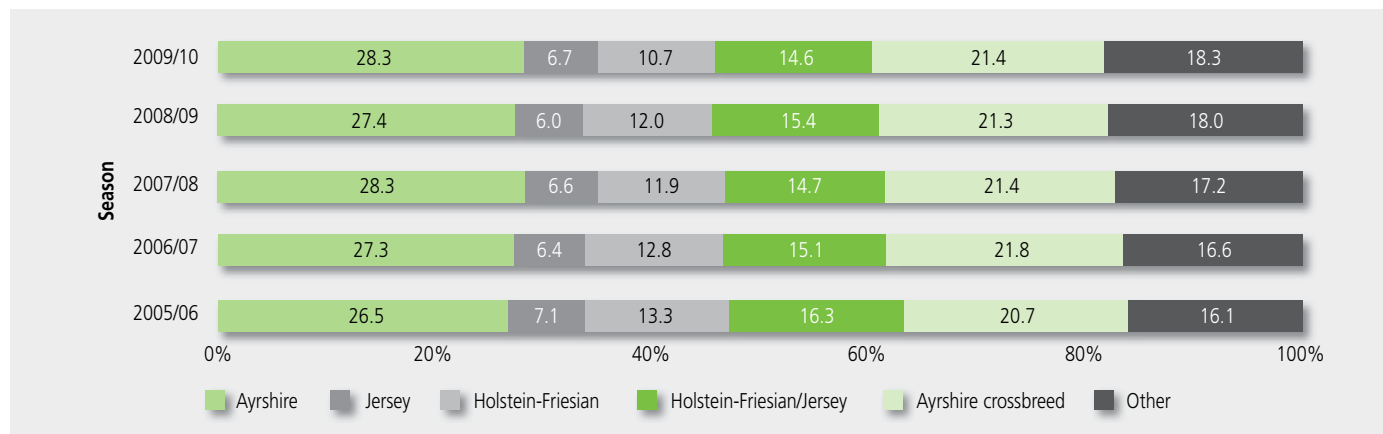
In 2009/10 the average number of inseminations per cow (1.32) (recorded on the LIC National Database) has decreased compared with the two previous seasons.

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

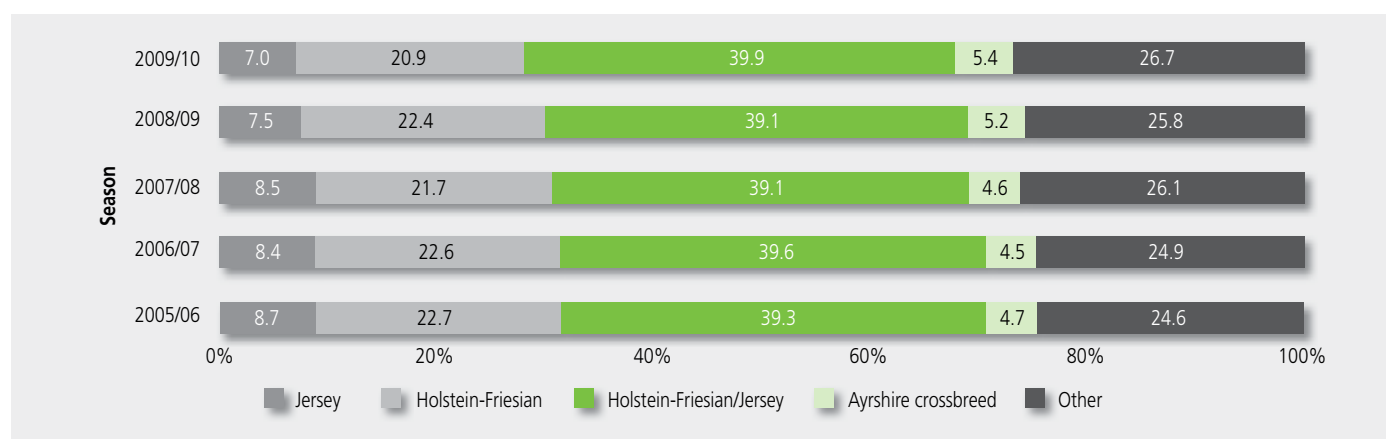


The use of Ayrshire, Holstein-Friesian and Jersey semen over different cow breeds for the past five seasons is shown in the graphs below. Ayrshire semen use over Ayrshire cows is 28.3% (Graph 4.6). Crossbreed semen is used predominantly over Friesian/Jersey crosses (Graph 4.7). The use of Jersey semen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

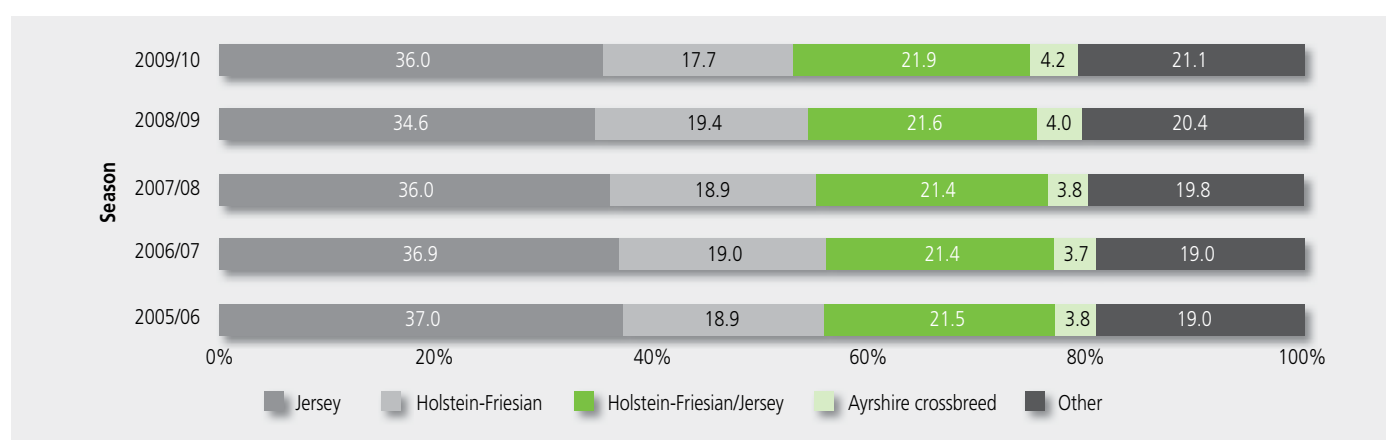
Graph 4.6: Ayrshire semen usage (%) over cow breed for the last five seasons



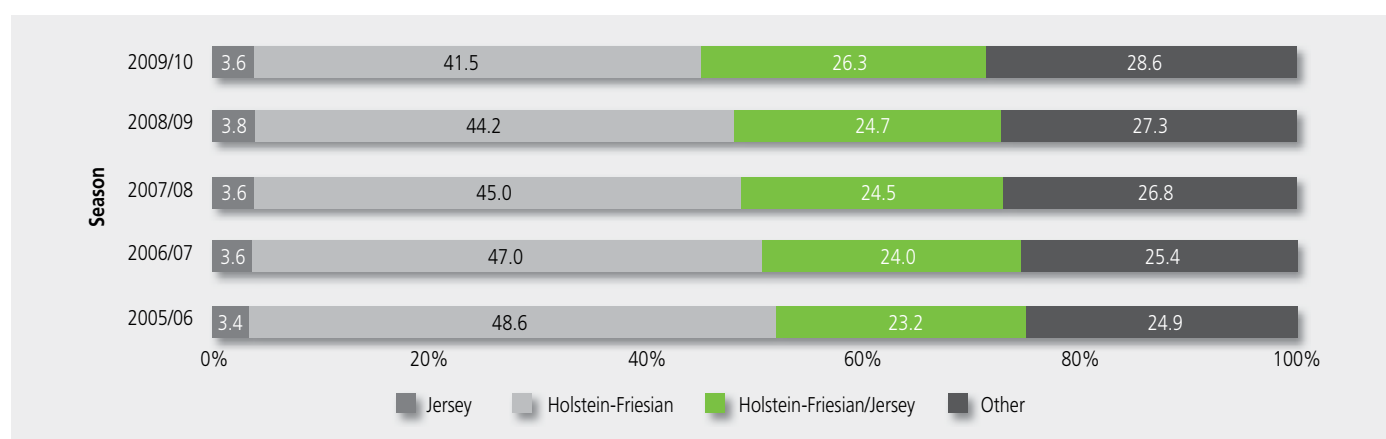
Graph 4.7: Crossbreed semen usage (%) over cow breed for the last five seasons



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

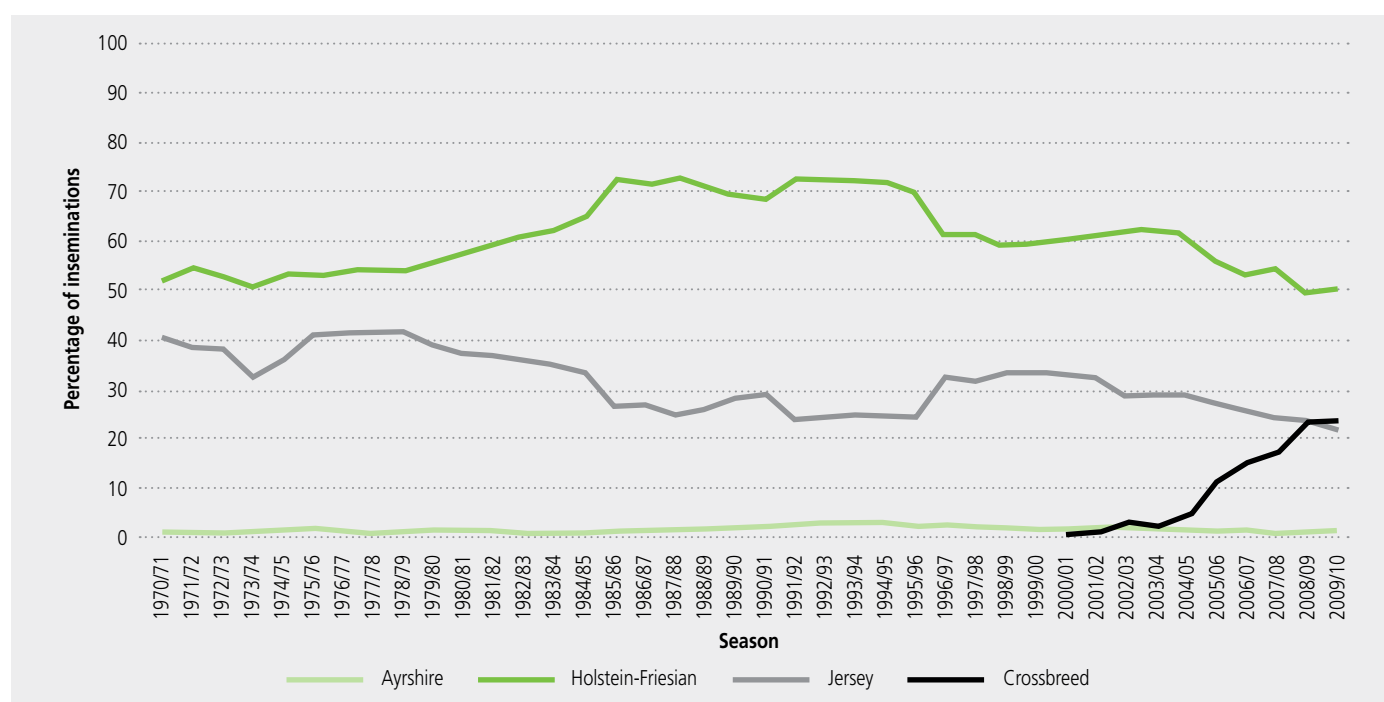


Graph 4.9: Holstein-Friesian semen usage (%) over cow breed for the last five seasons



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 remained steady at about 50%, while inseminations for the Jersey breed continues to decline. The percentage of inseminations for crossbreed (shown for the last ten seasons) held steady at 23.6% and is now slightly ahead of the percentage of Jersey inseminations.

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



D. Animal Evaluation

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

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

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

For each economic index, Economic Values are calculated for the relevant traits. For Breeding Worth, the Economic Values represent the net income per unit of feed from breeding replacements with a one unit genetic improvement in the trait. For Production Worth, the Economic Values represent the net income per unit of feed from milking cows with a one unit improved productive ability in the trait. In each case the base unit of feed is 4.5 tonnes of dry matter in average quality pasture.

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

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

where: BV = Breeding Value for each trait

\$EV = Economic Value for each trait for breeding replacements

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

The economic values for 2010 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 13 February 2010

	Milkfat (\$/kg)	Protein (\$/kg)	Milk (\$/kg)	Liveweight (\$/kg)	Somatic Cell (\$/score)	Fertility (\$/%)	Residual Survival (\$/day)
Breeding Worth	1.570	8.215	-0.085	-1.238	-30.001	2.867	0.043
Production Worth	1.456	7.041	-0.074	-1.078	-	-	-

The information for all Animal Evaluation statistics was sourced from cows and sires recorded on the LIC National Database as of 8 May 2010. 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 2005 first proven in the 2009/10 season with a BW Reliability of 75% or greater. Reliability of BW is reported on a scale from 0% to 99%. Zero percent is the case where there are no performance records for any related animal used in the bull's evaluation. Ninety-nine percent is the case where the bull has a very large number of performance-recorded daughters.

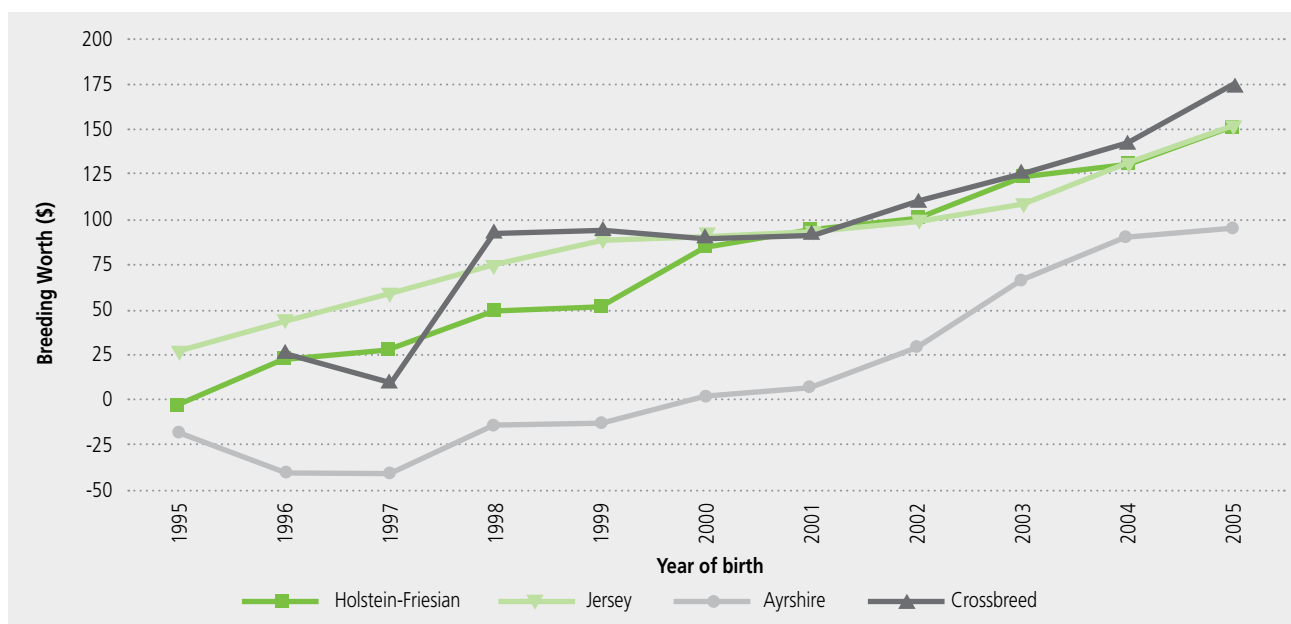
Table 4.10: Average Breeding Values and Breeding Worth of 2005 born bulls (reliability of 75% or greater)

Breed	Milkfat BV	Protein BV	Milk Volume BV	Liveweight BV	Somatic Cell BV	Fertility BV	Residual Survival BV	BW	Number of Bulls
Ayrshire	13.0	13.3	331.0	-0.7	-0.21	-7.1	151.5	95.2	4
Holstein Friesian	22.4	30.2	834.6	46.5	0.08	-0.7	-11.6	149.8	193
Jersey	12.7	3.6	-366.2	-55.7	0.10	1.9	0.3	152.4	130
Holstein Friesian Jersey Cross	21.1	17.0	162.1	-10.9	0.07	1.8	-11.8	174.6	83

(Evaluation date: 8 May 2010)

The genetic trend of proven dairy bulls is shown in Graph 4.11. Bulls born in 2005 are first proven in the 2009/10 season.

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



(Evaluation date: 8 May 2010)

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
1995	492	300	142	0	41	9
1996	444	249	149	2	38	6
1997	449	281	130	3	29	6
1998	465	273	152	6	30	4
1999	455	244	142	23	39	7
2000	517	272	132	69	39	5
2001	498	234	153	74	31	6
2002	514	261	156	73	21	3
2003	488	246	142	69	30	1
2004	476	230	141	85	20	0
2005	410	193	130	83	4	0

(Evaluation date: 8 May 2010)

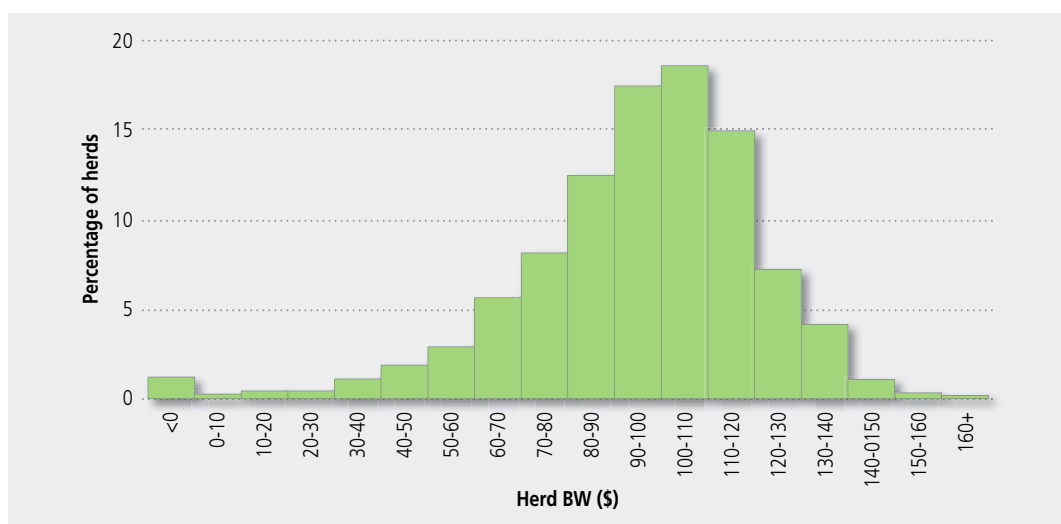
The Breeding Worth for **herds** presented below (Table 4.12 and Graph 4.12) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2009/10 season. Table 4.12 shows that 50% of these herds had a BW of 97 or above and 25% of these herds had a BW of 111 or above.

Table 4.12: Herd Breeding Worth in 2009/10

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Herd BW	97	> 131	> 122	> 111	< 79	< 58	< 40

(Evaluation date: 8 May 2010)

Graph 4.12: Distribution of Herd Breeding Worth in 2009/10



(Evaluation date: 8 May 2010)

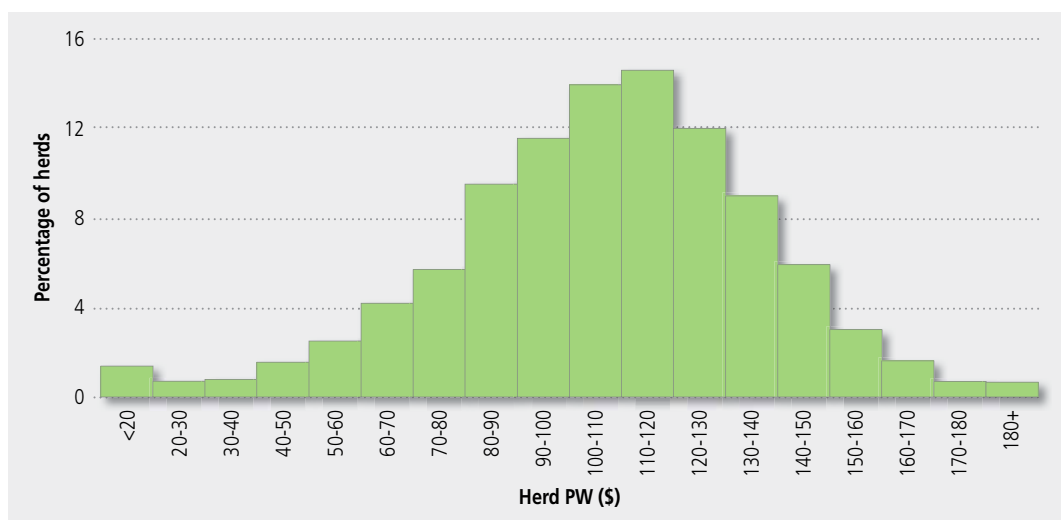
The Production Worth (PW) for **herds** presented below (Table 4.13 and Graph 4.13) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2009/10 season. Table 4.13 shows that 50% of these herds had a PW of 106 or above and 25% of these herds had a PW of 125 or above.

Table 4.13: Herd Production Worth in 2009/10

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Herd PW	106	> 152	> 142	> 125	< 86	< 64	< 47

(Evaluation date: 8 May 2010)

Graph 4.13: Distribution of Herd Production Worth in 2009/10



(Evaluation date: 8 May 2010)

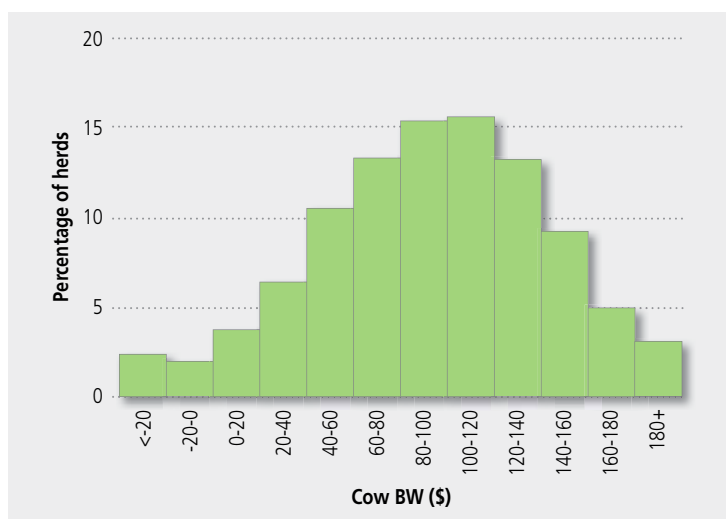
The Breeding Worth (BW) for **cows** presented below (Table 4.14 and Graph 4.14) is based on all cows of the users of herd testing services, in herds with at least 80 cows, and signed up for herd testing in the 2009/10 season. Table 4.14 shows that 50% of these cows had a BW of 95 or above and that 25% of these cows had a BW of 128 or above.

Table 4.14: Cow Breeding Worth in 2009/10

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Cow BW	95	> 171	> 155	> 128	< 60	< 27	< 4

(Evaluation date: 8 May 2010)

Graph 4.14: Distribution of Cow Breeding Worth in 2009/10



(Evaluation date: 8 May 2010)

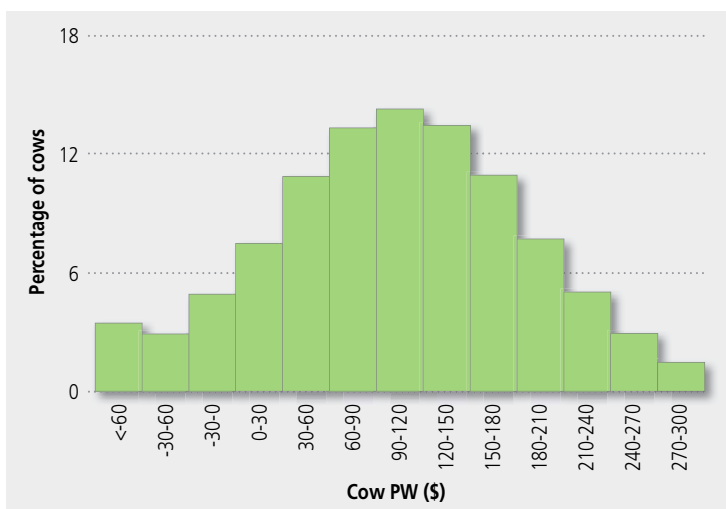
The Production Worth (PW) for **cows** presented below (Table 4.15 and Graph 4.15) is based on cows of the users of herd testing services, in herds with at least 80 cows, in the 2009/10 season. Table 4.15 shows that 50% of these cows had a PW of 105 or above and that 25% of these cows had a PW of 161 or above.

Table 4.15: Cow Production Worth in 2009/10

	Median	Top 5%	Top 10%	Top 25%	Bottom 25%	Bottom 10%	Bottom 5%
Cow PW	105	> 247	> 214	> 161	< 49	< -7	< -42

(Evaluation date: 8 May 2010)

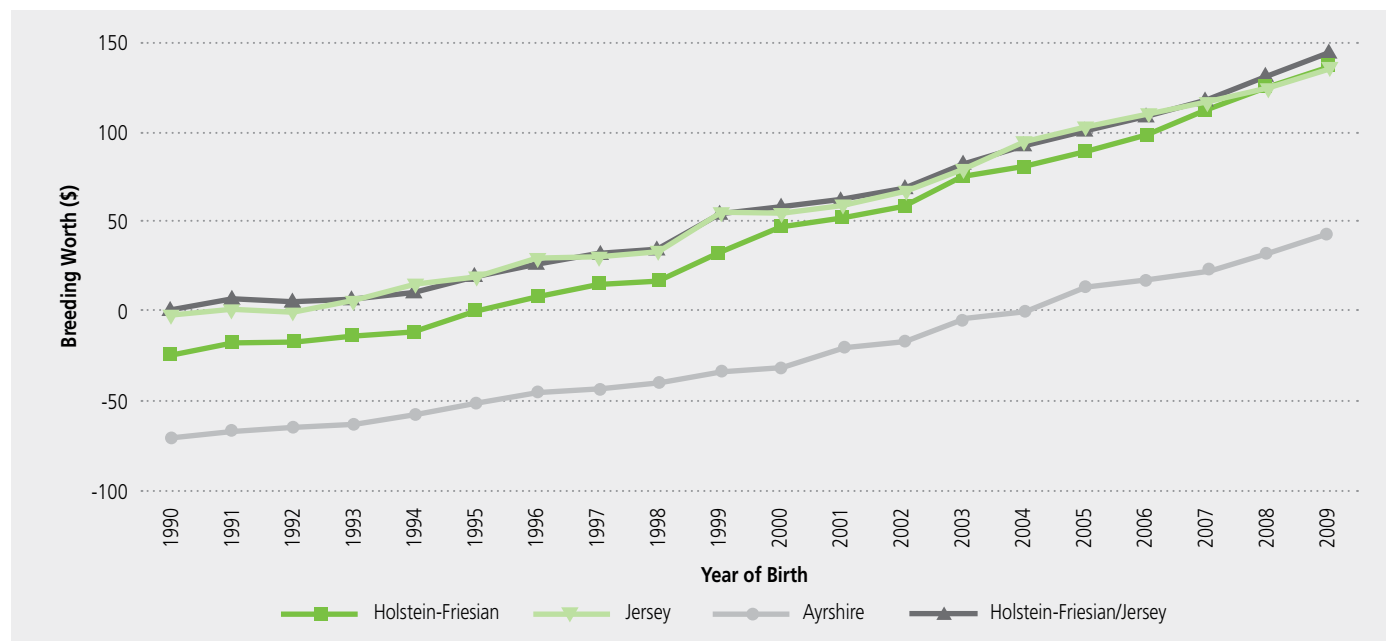
Graph 4.15: Distribution of Cow Production Worth in 2009/10



(Evaluation date: 8 May 2010)

The genetic trend for cows is based on all cows (alive or dead) recorded on the Livestock Improvement National Database in the 2009/10 season. Also included are the estimated BW and PW for replacement stock (2008 and 2009 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.

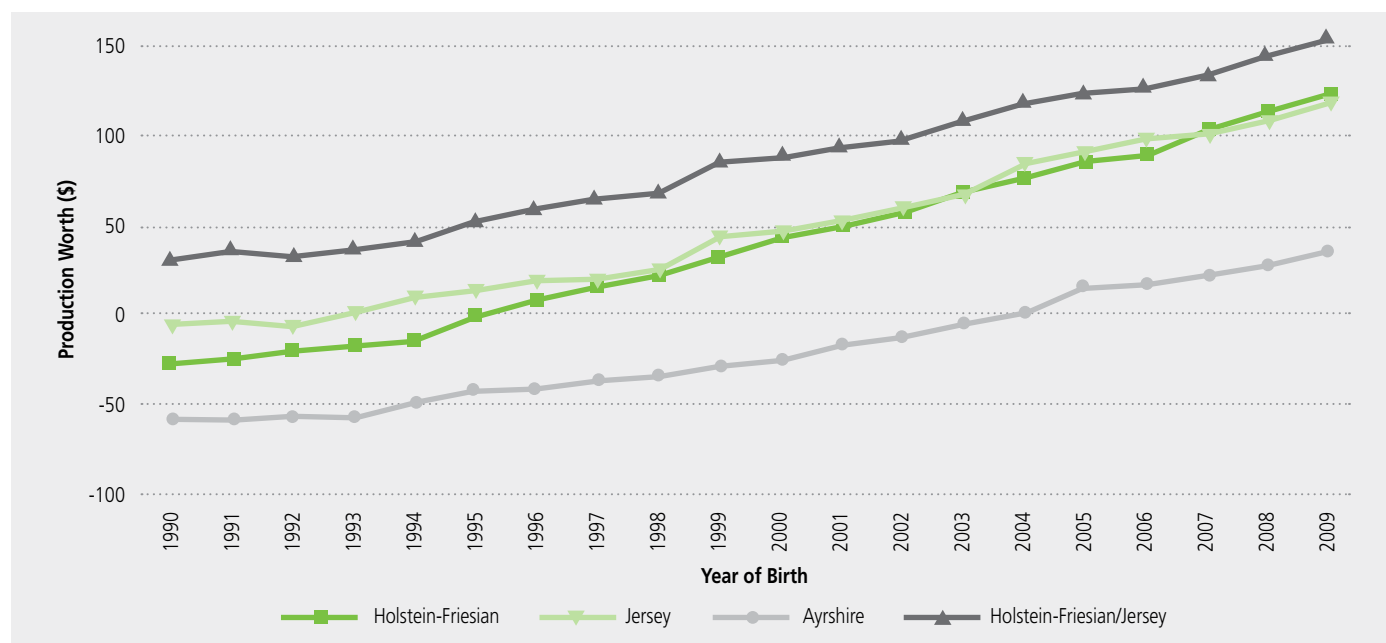
Graph 4.16: Trend in Breeding Worth for all cows



(Evaluation date: 8 May 2010)

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

Graph 4.17: Trend in Production Worth for all cows



(Evaluation date: 8 May 2010)

Table 4.16 shows the average BVs and BW by breed, of all 2007 born cows. The Holstein-Friesian/Jersey cows had the highest average BW at 117.2. The Holstein-Friesian cows had the highest milkfat, protein, and milk volume BVs. All evaluations are comparable across breeds.

Table 4.16: Average Breeding Worth and Breeding Values of all cows by breed born in 2007

<i>Breed</i>	<i>BW \$</i>	<i>Milkfat BV (kg)</i>	<i>Protein BV (kg)</i>	<i>Milk Volume BV (l)</i>	<i>Liveweight BV (kg)</i>	<i>Somatic Cell BV (score)</i>	<i>Fertility BV (%)</i>	<i>Residual Survival BV (days)</i>	<i>Cow Numbers</i>
Holstein-Friesian	114.1	20.2	21.2	573	33.0	0.09	0.7	-41	415,233
Jersey	115.0	9.6	-1.5	-484	-55.0	0.06	2.2	-25	129,816
Ayrshire	24.2	-2.0	3.9	60	-0.1	-0.18	-3.9	144	8,512
Holstein-Friesian /Jersey	117.2	16.1	10.8	75	7.3	0.07	1.5	-36	399,588
Guernsey	-137.0	-18.0	-11.0	-383	16.9	0.31	-5.5	-88	87
Milking Shorthorn	-69.1	-17.0	-5.9	-204	7.5	-0.04	-1.9	133	509
Brown Swiss	-102.0	-18.0	-4.0	-210	32.8	-0.18	-12.0	259	102
Other	89.5	10.7	8.9	66	-5.6	0.01	0.0	3	60,001
Weighted Average	113.1	16.5	13.3	207	9.0	0.07	1.1	-33	1,013,848

(Evaluation date: 8 May 2010)

Survivability is measured by the percentage of cows that have a lactation recorded for consecutive years. In the 2009/10 season, the values in the “2-3 years” column are the percentage of cows that were milking as two-year-olds in the 2008/09 season and are now milking as three-year-olds in the 2009/10 season. Table 4.17 shows that for the 2009/10 season the highest percentage of survival is in animals ageing from 3-4 years (87.27%), followed closely by animals ageing from 2-3 years (87.0%).

Table 4.17: Survivability percentages since 1996/97

<i>Season</i>	<i>Percentage (%) of age group surviving to next lactation</i>						
	<i>2-3 years</i>	<i>3-4 years</i>	<i>4-5 years</i>	<i>5-6 years</i>	<i>6-7 years</i>	<i>7-8 years</i>	<i>8-9 years</i>
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

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 dairy co-operative payout was \$6.37**

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

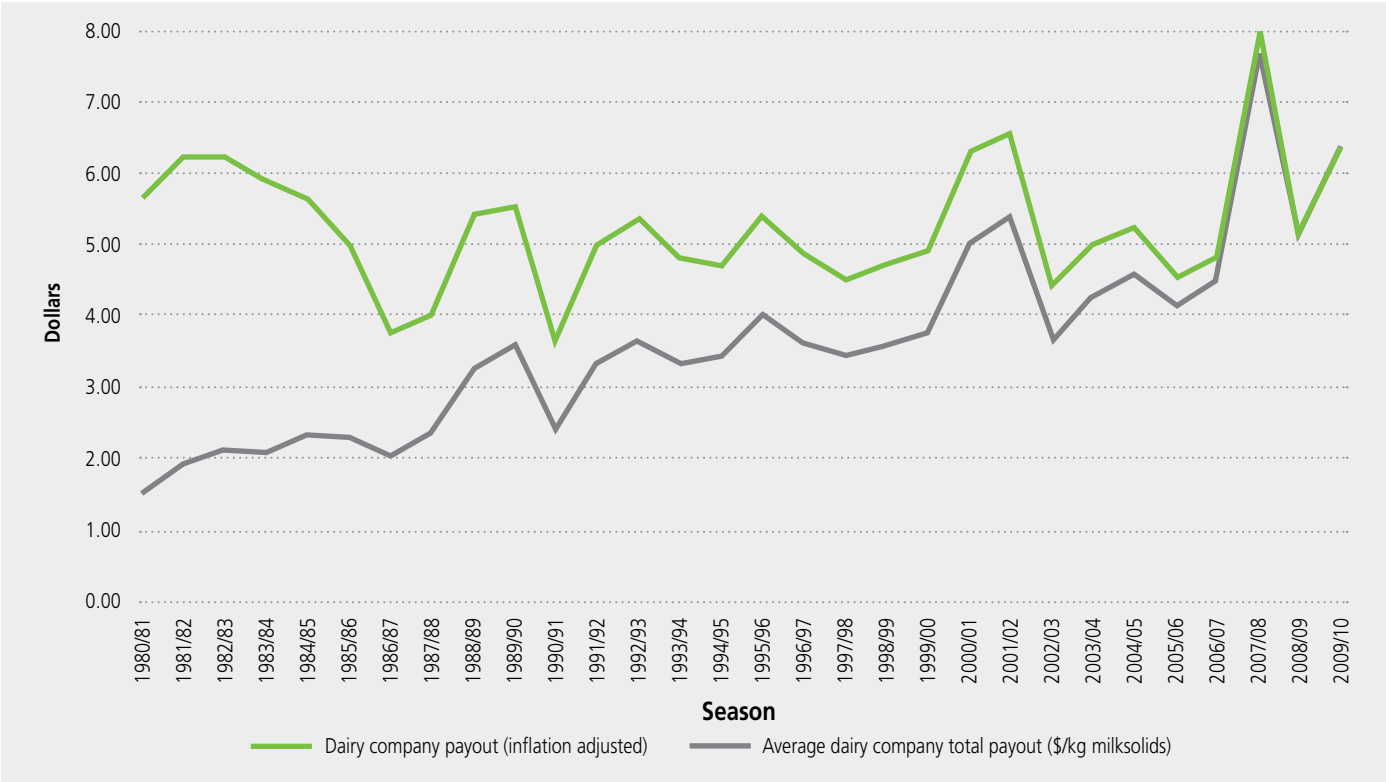
Table 5.1: Trend in prices received for milksolids for the last 20 seasons

Season	Average Dairy Company total payout (\$/kg milksolids)	Dairy Company payout (inflation adjusted) ^a
1990/91	2.42	3.62
1991/92	3.34	4.95
1992/93	3.66	5.34
1993/94	3.32	4.79
1994/95	3.40	4.70
1995/96	3.99	5.41
1996/97	3.63	4.86
1997/98	3.42	4.50
1998/99	3.58	4.73
1999/00	3.78	4.89
2000/01	5.01	6.29
2001/02	5.35	6.54
2002/03	3.66	4.41
2003/04	4.25	5.00
2004/05	4.58	5.24
2005/06	4.10	4.51
2006/07	4.46	4.81
2007/08	7.67	7.96
2008/09	5.14	5.23
2009/10 ^b	6.37	6.37

^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

- Number of farms sold drops dramatically
- Average sale price of farms drops to \$2.6 million
- Nominal price per hectare also falls

The average sale price of dairy farms (\$2.64 million) decreased 19% in 2009 (Table 5.2). The inflation- adjusted average price per hectare has dropped back to 2007 levels.

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

Year	Number of farms sold	Average sale price (\$)	Inflation adjusted average sale price ^a	Average hectares	Average price per hectare (\$)	Inflation adjusted average price per hectare ^a	Price per kg milkfat ^b	Price per kg milksolids ^c	CPI
1990	868	373,553	573,894	58	6,467	9,935	21.8	12.5	716
1991	538	362,819	542,257	58	6,283	9,390	21.7	12.5	736
1992	897	446,979	661,745	62	7,183	10,634	23.1	13.3	743
1993	834	543,984	794,665	61	8,903	13,006	31.0	17.8	753
1994	784	704,245	1,017,963	61	11,640	16,825	37.5	21.6	761
1995	672	775,110	1,071,132	58	13,400	18,518	41.9	24.1	796
1996	784	785,510	1,064,115	60	13,187	17,864	41.6	23.9	812
1997	520	674,809	904,129	54	12,388	16,598	38.5	22.1	821
1998	496	704,309	927,832	64	11,076	14,591	32.0	18.4	835
1999	600	769,606	1,017,508	72	10,759	14,225	33.1	19.0	832
2000	576	856,374	1,109,554	80	10,740	13,915	35.3	20.3	849
2001	941	1,032,618	1,296,666	74	13,959	17,528	41.2	23.7	876
2002	704	1,049,939	1,283,259	72	14,658	17,915	45.6	26.2	900
2003	722	1,347,676	1,623,706	82	16,498	19,877	49.9	28.7	913
2004	800	1,550,792	1,824,461	85	18,287	21,514	50.1	28.8	935
2005	728	1,833,049	2,096,002	87	21,085	24,110	56.2	32.3	962
2006	576	2,208,693	2,429,562	87	25,308	27,839	65.4	37.6	1000
2007	699	2,541,870	2,741,232	91	28,035	30,234	73.6	42.3	1020
2008	662	3,267,025	3,387,114	93	35,143	36,435	88.4	50.8	1061
2009	277	2,641,186	2,641,186	84	31,323	31,323	64.4	37.0	1100

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

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

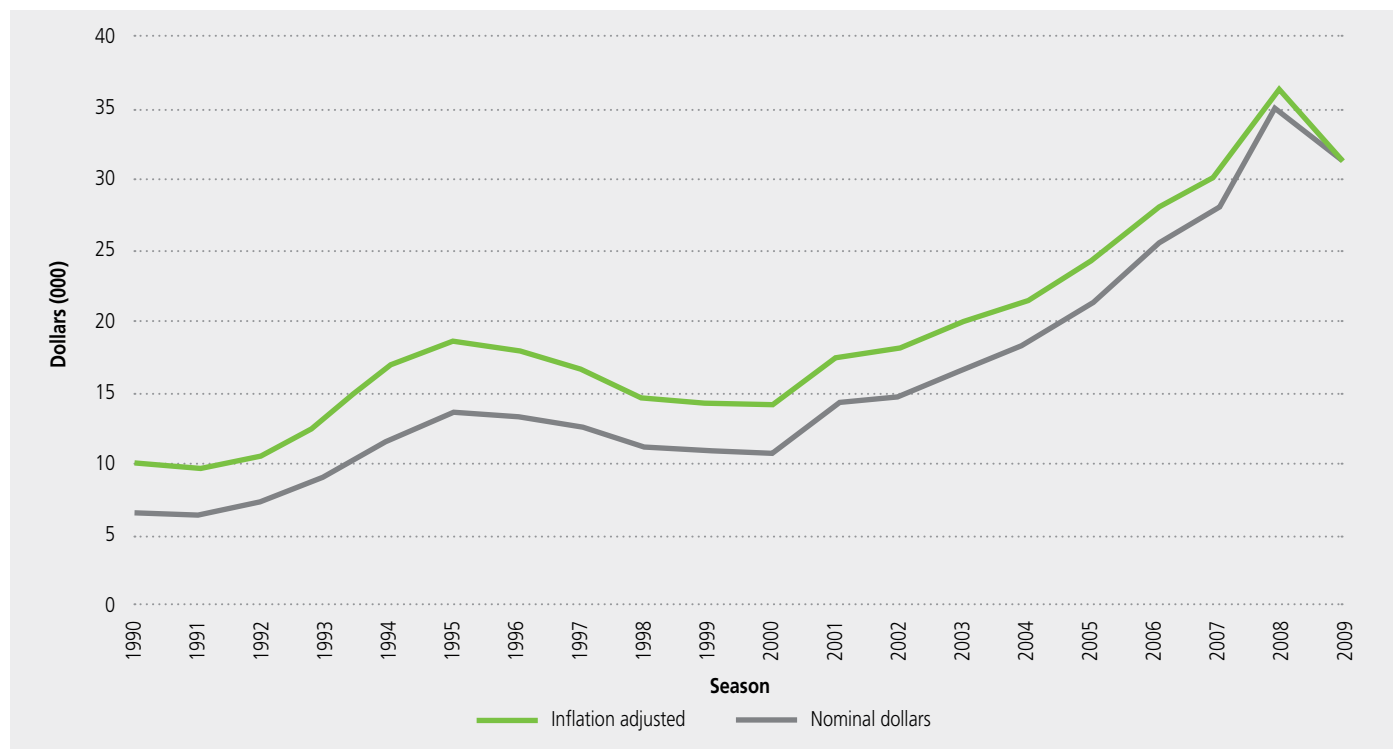
^b Price per kg milkfat has been derived from price per kg milksolids (1996 to current year)

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

^d Half year only – sales to June 2004

Prior to 1992 the average price per hectare fluctuated considerably, in both real and nominal terms, as shown in Graph 5.2. The average price per hectare rose steeply from 1992 to 1995. Between 1995 and 2000, the average price per hectare decreased. However, this trend reversed decisively in 2001 peaking in 2008 where the average price per hectare was \$35,143. These figures are based on the calendar year (Jan-Dec), as opposed to the dairy industry season (Jun-May).

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



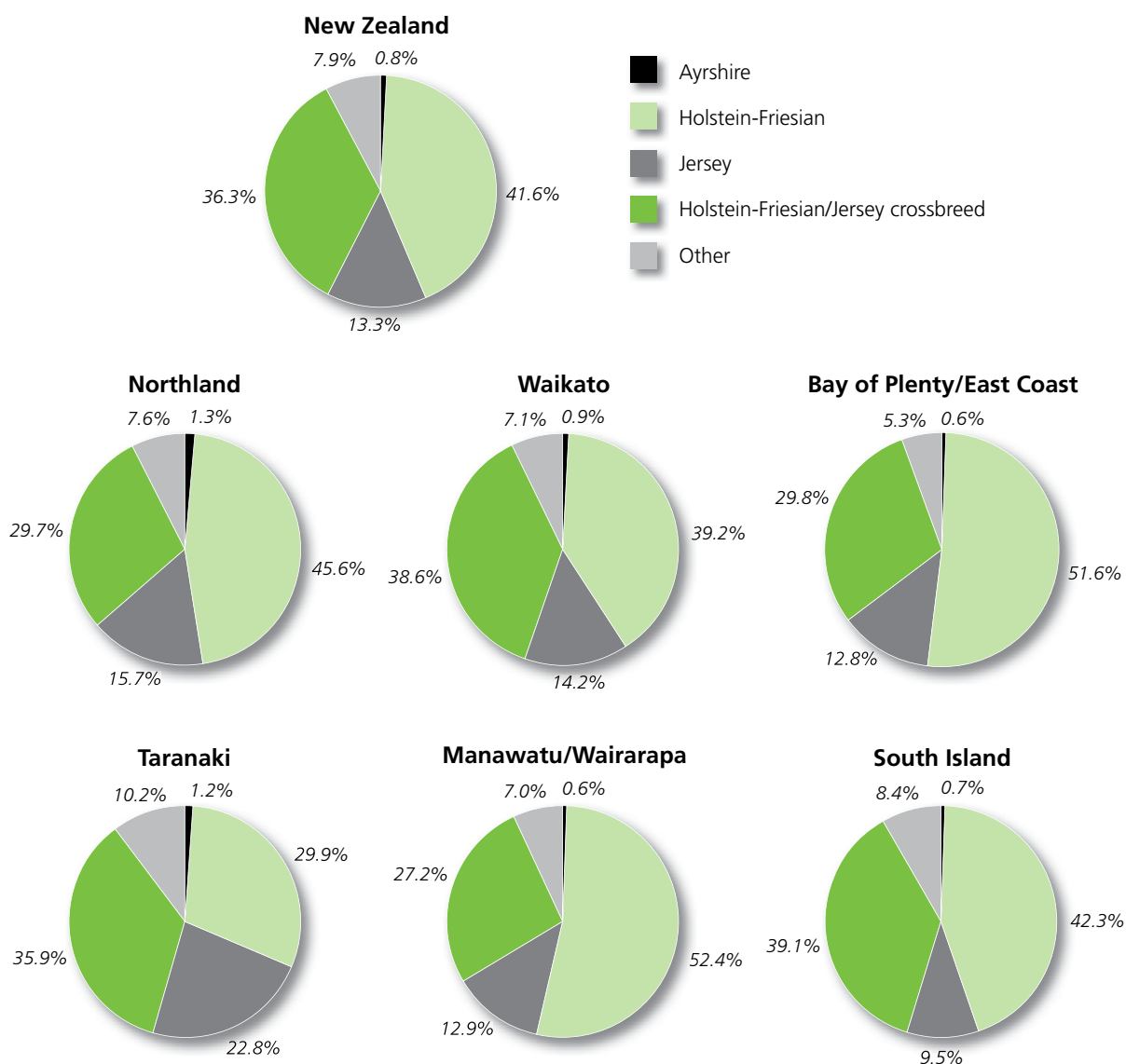
B. Breed breakdown

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

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

The percentages of the major dairy breeds for New Zealand and each region are shown in Graph 5.3. Percentages are given for Holstein-Friesian, Jersey, Holstein-Friesian/Jersey crossbreed and Ayrshire cows with the remaining breeds and crossbreeds grouped into "Other". Holstein-Friesian is the prevalent breed in every region except Taranaki, where Holstein-Friesian/Jersey crossbreed is prevalent. Manawatu / Wairarapa region (formerly Wellington / Hawkes Bay) continues to have the highest percentage of Holstein-Friesian cows (52.4%) followed closely by Bay of Plenty/East Coast (51.6%). Taranaki has the highest proportion of Jerseys (22.8%) and the South Island has the highest proportion of Holstein-Friesian/Jersey crossbreeds (39.1%), followed closely by Waikato (formerly Auckland, 38.6%).

Graph 5.3: Breed percentages of cows in each LIC region in 2009/10



C. Calving

i) Planned start of calving and median calving dates

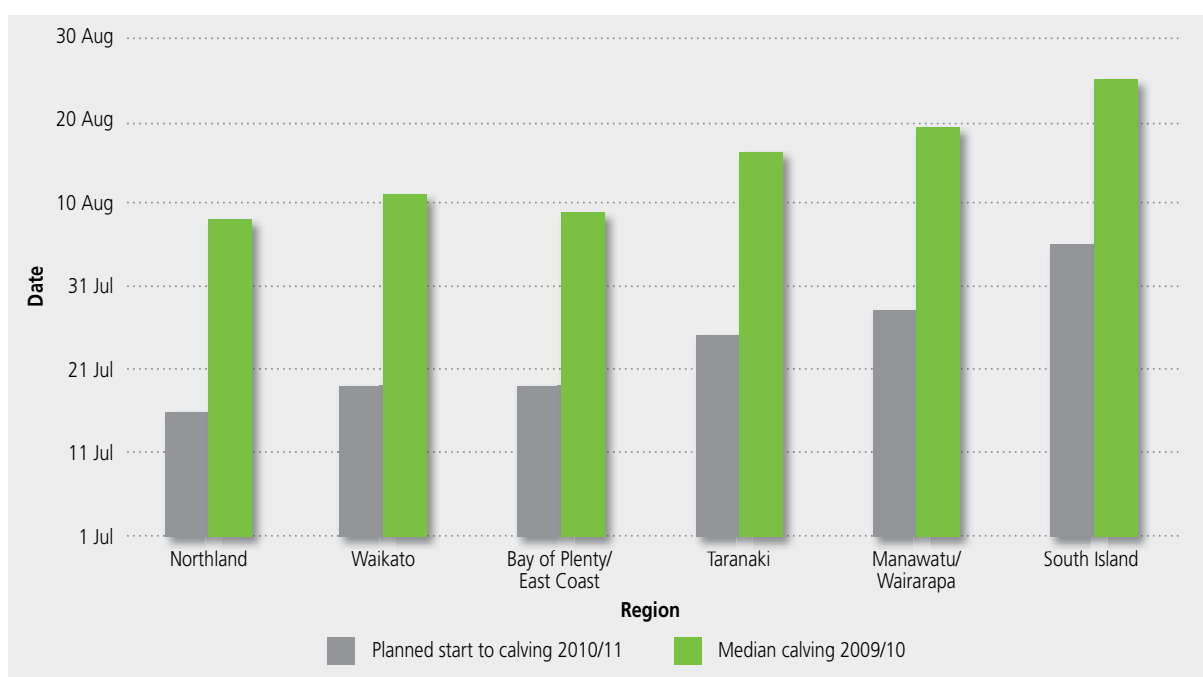
The trend in calving dates within and between regions is best shown by the “planned start of calving” date. The planned start of calving date is 282 days from the date that mating is started in the herd. The farmer has control over, and the ability to change, the start of mating.

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.

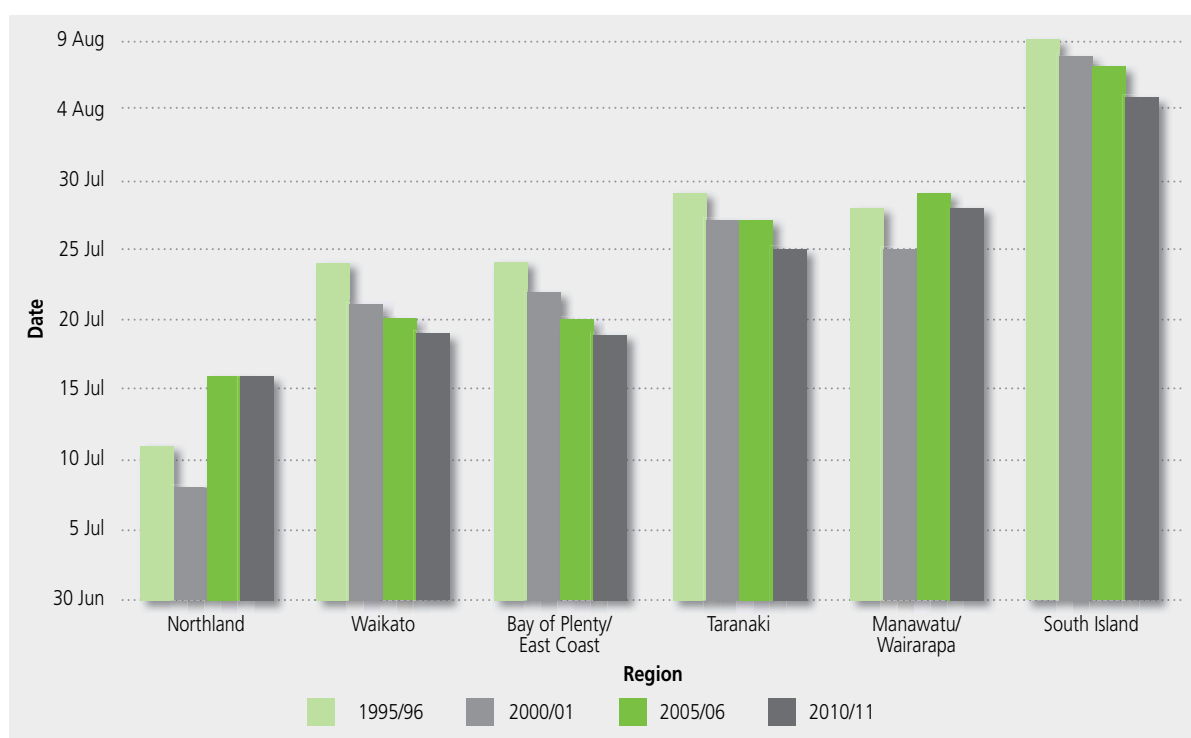
The forecast planned start of calving and actual median calving dates for cows (excluding first calvers) for the 2009/10 season are shown in Graph 5.4.

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 1995/96 is shown in graph 5.5. The trend for four of the six regions (Waikato (formerly Auckland), Bay of Plenty/East Coast, Taranaki, and South Island) is for an earlier planned start of calving. Planned start of calving in Northland is now the 16 July, up 5 days from 1995/96. Manawatu / Wairarapa (formerly Wellington/Hawkes Bay) seems steady on or about the 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 induction 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

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 64% of all herds.

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

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

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

Contract milkers are contracted to milk a herd at a set price per kilogram of milksolids produced. The rate is set according to the amount of farm work done. In 2009/10, not all farms with contract milkers could be identified, and consequently any farms with contract milkers are included with owner-operators.

- 35% of all milkers are sharemilkers
- 57% 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 2009/10, 4,041 (35%) New Zealand dairy herds operated under a sharemilking agreement. Fifty-seven percent (2,303) of all sharemilkers have 50/50 agreements.

Table 5.4: Herd analysis by operating structure in 2009/10

Operating structure	Number of herds	Percentage of herds	Average herd size	Average effective hectares	Average cows per effective hectare
Owner-operators	7,616	65.1	377	135	2.78
Sharemilkers:					
Less than 20%	147	1.3	500	159	3.14
20-29%	1,222	10.5	392	136	2.89
30-49%	200	1.7	306	114	2.69
50/50	2,303	19.7	368	129	2.84
over 50%	169	1.4	353	121	2.91
All sharemilkers	4,041	34.6	376	131	2.87
Unknown	34	0.3	120	53	2.24
All farms	11,691		376	134	2.81

Note: Contract milkers are included with owner-operators

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

Table 5.5: Herd production analysis by operating structure in 2009/10

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	1,409,802	69,758	122,900	515	908	185	326
Sharemilkers:							
Less than 20%	2,048,711	102,725	181,494	646	1,141	206	363
20-29%	1,485,548	73,848	129,980	544	957	188	331
30-49%	1,148,312	56,973	100,297	501	882	186	328
50/50	1,373,356	68,196	119,996	527	927	185	326
over 50%	1,349,038	66,379	117,118	548	967	188	332
All Sharemilkers	1,419,695	70,530	124,157	537	946	187	330
Unknown	259,200	12,966	22,674	243	425	108	190
All farms	1,409,875	69,859	123,043	522	920	186	327

Note: Contract milkers are included with owner-operators

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

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

Operating structure	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Owner-operators	61.8	62.1	62.5	62.7	63.7	63.9	63.4	63.1	63.6	65.1
Sharemilkers:										
Less than 20%	0.5	0.9	0.7	0.6	0.6	0.7	0.8	1.0	1.5	1.3
20-29%	4.2	9.2	8.8	8.6	8.2	8.6	8.8	9.1	10.4	10.5
30-49%	1.5	2.5	2.3	2.3	2.1	1.9	1.8	1.7	1.8	1.7
50/50	24.0	23.3	23.3	23.7	23.3	22.9	22.3	21.7	20.5	19.7
over 50%	7.2	1.8	1.9	1.9	1.9	1.7	1.7	1.7	1.8	1.4
All sharemilkers	37.3	37.8	36.9	37.1	36.1	35.8	35.4	35.4	36.0	34.6
Unknown	0.8	0.1	0.5	0.2	0.2	0.2	1.2	1.5	0.5	0.3

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

Operating structure	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Owner-operators	8,592	8,476	8,215	8,000	7,820	7,594	7,374	7,215	7,384	7,616
Sharemilkers:										
Less than 20%	64	127	96	78	68	78	93	119	177	147
20-29%	590	1259	1,150	1,094	1,012	1,026	1,019	1,045	1,206	1,222
30-49%	203	347	298	292	257	231	208	198	207	200
50/50	3,331	3,185	3,064	3,027	2,863	2,719	2,599	2,483	2,381	2,303
over 50%	999	246	246	239	228	206	203	199	207	169
All sharemilkers	5,187	5,164	4,854	4,730	4,428	4,260	4,122	4,044	4,178	4,041
Other/Unknown	113	9	71	21	23	29	134	177	56	34
Total	13,892	13,649	13,140	12,751	12,271	11,883	11,630	11,436	11,618	11,691

Table 5.8 compares the number (and percentage) of owner-operators with sharemilkers by region.

Table 5.8: Operating structure by region in 2009/10

<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 (excl. unknown)</i>
Northland	692	9.1	227	5.6	130	5.6	97	5.6	919
Auckland	285	3.7	161	4.0	107	4.6	54	3.1	446
Waikato	2,217	29.1	1,348	33.4	865	37.6	483	27.8	3,565
Bay of Plenty	397	5.2	208	5.1	120	5.2	88	5.1	605
Central Plateau	304	4.0	157	3.9	96	4.2	61	3.5	461
Western Uplands	67	0.9	15	0.4	5	0.2	10	0.6	82
East Coast	11	0.1	2	0.0	2	0.1	0	0.0	13
Hawkes Bay	60	0.8	10	0.2	6	0.3	4	0.2	70
Taranaki	1,023	13.4	728	18.0	377	16.4	351	20.2	1,751
Manawatu	400	5.3	157	3.9	81	3.5	76	4.4	557
Wairarapa	340	4.5	132	3.3	67	2.9	65	3.7	472
North Island	5,796	76.1	3,145	77.8	1,856	80.6	1,289	74.2	8,941
Nelson/Marlborough	192	2.5	49	1.2	29	1.3	20	1.2	241
West Coast	287	3.8	79	2.0	36	1.6	43	2.5	366
North Canterbury	454	6.0	195	4.8	103	4.5	92	5.3	649
South Canterbury	166	2.2	76	1.9	33	1.4	43	2.5	242
Otago	201	2.6	167	4.1	90	3.9	77	4.4	368
Southland	520	6.8	330	8.2	156	6.8	174	10.0	850
South Island	1,820	23.9	896	22.2	447	19.4	449	25.8	2,716
New Zealand	7,616	100.0	4,041	100.0	2,303	100.0	1,738	100.0	11,657

Table 5.9 shows the number and percentage of owner-operators and sharemilkers by herd size. The percentage of share-milkers at each herd size category is similar to that of owner-operators.

Table 5.9: Operating structure by herd size in 2009/10

<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 (excl. unknown)</i>
10-49	12	0.2	1	0.0	1	0.0	0	0.0	13
50-99	198	2.6	88	2.2	51	2.2	37	2.1	286
100-149	581	7.6	278	6.9	177	7.7	101	5.8	859
150-199	938	12.3	510	12.6	304	13.2	206	11.9	1,448
200-249	1,149	15.1	567	14.0	339	14.7	228	13.1	1,716
250-299	842	11.1	463	11.5	271	11.8	192	11.0	1,305
300-349	810	10.6	433	10.7	242	10.5	191	11.0	1,243
350-399	516	6.8	288	7.1	153	6.6	135	7.8	804
400-449	492	6.5	271	6.7	143	6.2	128	7.4	763
450-499	323	4.2	185	4.6	92	4.0	93	5.4	508
500-549	329	4.3	196	4.9	107	4.6	89	5.1	525
550-599	238	3.1	137	3.4	80	3.5	57	3.3	375
600-649	209	2.7	136	3.4	75	3.3	61	3.5	345
650-699	164	2.2	83	2.1	48	2.1	35	2.0	247
700-749	134	1.8	70	1.7	33	1.4	37	2.1	204
750-799	105	1.4	73	1.8	50	2.2	23	1.3	178
800-849	105	1.4	53	1.3	29	1.3	24	1.4	158
850-899	75	1.0	39	1.0	16	0.7	23	1.3	114
900-949	66	0.9	30	0.7	11	0.5	19	1.1	96
950-999	47	0.6	23	0.6	15	0.7	8	0.5	70
1000-1099	97	1.3	35	0.9	24	1.0	11	0.6	132
1100-1199	49	0.6	25	0.6	12	0.5	13	0.7	74
1200-1499	80	1.1	40	1.0	20	0.9	20	1.2	120
1500+	57	0.7	17	0.4	10	0.4	7	0.4	74
Total/Avg	7,616	100.0	4,041	100.0	2,303	100.0	1,738	100.0	11,657

6. Disease control

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

For the second consecutive year, no EBL reactors were found among the dairy herds screened during 2009/10.

Once again, more than half of all dairy herds were tested, focussing especially on the South Island (where the last known EBL cases occurred in 2007/08). During the year, a number of herds with equivocal vat ELISA test results were subjected to further individual testing with several in-depth investigations – all with negative results. Consequently, all New Zealand dairy herds have now achieved EBL-free status (negative for more than 2 years).

The second anniversary without any EBL infected herds detected is significant because the 2008/09 (when the last EBL case was culled) cohort of South Island calves reached their first lactation this season and were included in the annual herd screening. At the same time, there continues to be no evidence of new EBL incursions from the beef industry via natural mating bulls.

Annual vat monitoring of 50% or more of the national herd will continue to ensure that the New Zealand dairy herd remains free of EBL.

Table 6.1: Summary of EBL status point-prevalences at the end of the season from 2006 to 2010

Although the risk of undetected EBL-infected dairy cattle is small, pockets of infection might have escaped detection amongst non-milking stock. The beef industry has also not been formally surveyed for the presence of the disease and continues to present a potential risk through untested natural mating bulls. Annual herd screening therefore needs to be sustained to protect the dairy industry against possible re-emergence or re-introduction from the beef industry.

NZ Dairy Herd EBL Status	June 2010	June 2009	June 2008	June 2007	June 2006
EBL-Positive Herds	0.00%	0.00%	0.00%	0.01%	0.02%
Annual Period Prevalence	0.00%	0.00%	< 0.02%	< 0.02%	0.07%
EBL-Suspect Herds	0.00%	0.00%	0.00%	0.00%	0.01%
Provisionally EBL-Negative	0.00%	0.00%	<0.02%	<0.02%	0.00%
EBL-Negative (year 1&2)	0.00%	0.02%	0.06%	2.53%	3.28%
EBL-Free Herds	99.99%	99.98%	99.90%	97.46%	96.70%
Total NZ Dairy Herds	100%	100%	100%	100%	100%
% of herds tested during season	52%	55%	64%	49%	52%
in the South Island	97%	99%	65%		
in the North Island	39%	43%	62%		

Positive herds: EBL has been diagnosed by milk or serum ELISA and negative herd retest after 60+ days post-cull has not yet been completed.

Suspect herds: Herds under investigation after screening until confirmation testing complete and herds with stock from POSITIVE herds.

Provisionally Negative herds: Negative whole herd test (including dry stock) at least 60+ days post-cull required.

Negative herds: Negative annual screening milk tests during peak lactation allow herds to progress through negative year 1 and 2 to free status.

EBL-free herds: Once herds have tested negative for 3 seasons after provisionally negative status they are accorded EBL-free status.

B. Tuberculosis (Tb) control

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

Table 6.2: Tuberculosis (Tb) testing and results in 2009/10

Region	Vector Status	Number of infected dairy herds June 2010	Number of dairy cattle primary tested	Number of Tuberculous ^a dairy cattle
Northland	Free	1	89,767	9
Auckland	Free	0	28,094	0
Waikato	Free	6	782,633	28
	Risk	3	203,522	15
Bay of Plenty	Free	1	74,584	23
	Risk	0	17,950	2
Gisborne	Free	0	474	0
Hawkes Bay	Free	1	14,699	0
	Risk	0	36,410	15
Taranaki	Free	3	153,306	14
Manawatu/Wanganui	Free	0	128,070	2
	Risk	0	63,872	0
Wellington	Risk	1	90,942	5
North Island	Free	12	1,271,627	76
	Risk	4	412,696	37
North Island	Total	16	1,684,323	113
Marlborough	Free	0	5,745	1
	Risk	0	2,838	0
Tasman/Nelson	Free	0	44,483	3
	Risk	0	12,572	0
West Coast	Free	0	8,495	3
	Risk	32	236,195	253
Canterbury	Free	2	286,768	24
	Risk	3	136,927	10
Otago	Free	0	123,251	1
	Risk	3	133,344	5
Southland	Free	1	188,979	5
	Risk	0	114,154	2
South Island	Free	3	657,721	37
	Risk	38	636,030	270
South Island	Total	41	1,293,751	307
New Zealand	Free	15	1,929,348	113
	Risk	42	1,048,726	307
New Zealand	Total	57	2,978,074	420

Sourced from Animal Health Board - Annual Report for the year ending 30 June 2010

^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

