



Dairy Statistics

2000-2001



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1. Introduction

Livestock Improvement Corporation Limited is a wholly-owned subsidiary of the New Zealand Dairy Board, with responsibility for the Board's farm production activities and, in particular, dairy herd improvement and herd records. Livestock Improvement aims to "lead the world with genetics and knowledge to create wealth for pastoral dairy farmers".

Livestock Improvement'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 Livestock Improvement National Database.

Dairy Statistics 2000-2001 contains many of the dairy industry statistics that were released until 1983/84 in the *New Zealand Dairy Board Farm Production Report*. In 1984/85, with the formation of the Livestock Improvement Division, the report was renamed the *Livestock Improvement Report*. In 1987/88 it was titled *Annual Report (Livestock Improvement Division)* and, with the establishment of the Livestock Improvement Corporation Limited in 1988, the report is now released under the title *Dairy Statistics*.

Source data used for the publication has altered over time. The statistics presented in *Dairy Statistics* from 1992/93 were obtained from dairy companies and from information stored on the Livestock Improvement National Database. Prior to 1991/92, the information for the *Dairy Statistics* publications was obtained primarily from the analysis of the New Zealand Dairy Industry Cow Census (an annual survey of all dairy farmers) last conducted for the 1990/91 season. The 1991/92 edition of *Dairy Statistics* was a transition year for which only minimal data was available.

In the Herd Improvement section of *Dairy Statistics* there is an important difference to the data presented in *Dairy Statistics* before 1995/96. Since the implementation of Animal Evaluation in June 1996 statistics presented from 1995/96 onward include bull and cow genetic trends.



2. National dairy statistics

A. Industry statistics

i) Production

■ Over 1 billion kilograms of milksolids processed

The statistics on milk, milkfat, protein and milksolids processed (Table 2.1) are based on figures provided by dairy companies to the New Zealand Dairy Board. These figures do not include town milk supply.

In 2000/01, four co-operatively owned dairy companies (Kiwi, NZDG, Tatua and Westland) processed over 12.3 billion litres of milk. Over one billion kilograms of milksolids was processed from seasonal supply units into products predominantly for export.

At 1,046 million kilograms, total milksolids processed into export products for the 2000/01 season represents an 8% increase from the 970 million kilograms processed in the previous season.

Table 2.1 Summary of milk production statistics since 1974/75

Season	Milk processed (million litres)	Milkfat processed (million kgs)	Protein processed (million kgs)	Milksolids processed (million kgs)
1974/75	5,222	244	181	425
1975/76	5,403	268	198	466
1976/77	5,775	275	204	479
1977/78	5,238	251	186	437
1978/79	5,655	274	203	477
1979/80	5,997	291	215	506
1980/81	5,868	282	209	491
1981/82	5,979	282	209	491
1982/83	6,096	290	214	505
1983/84	6,733	324	239	564
1984/85	6,965	332	245	578
1985/86	7,326	350	257	609
1986/87	6,385	301	222	524
1987/88	6,921	333	245	579
1988/89	6,533	311	237	541
1989/90	6,868	330	242	572
1990/91	7,077	343	254	599
1991/92	7,454	365	270	637
1992/93	7,629	373	277	651
1993/94	8,603	423	313	736
1994/95	8,633	422	311	733
1995/96	9,325	452	335	788
1996/97	10,339	506	375	880
1997/98	10,651	513	378	891
1998/99	10,168	486	363	850
1999/00	11,480	554	416	970
2000/01	12,322	597	448	1,046

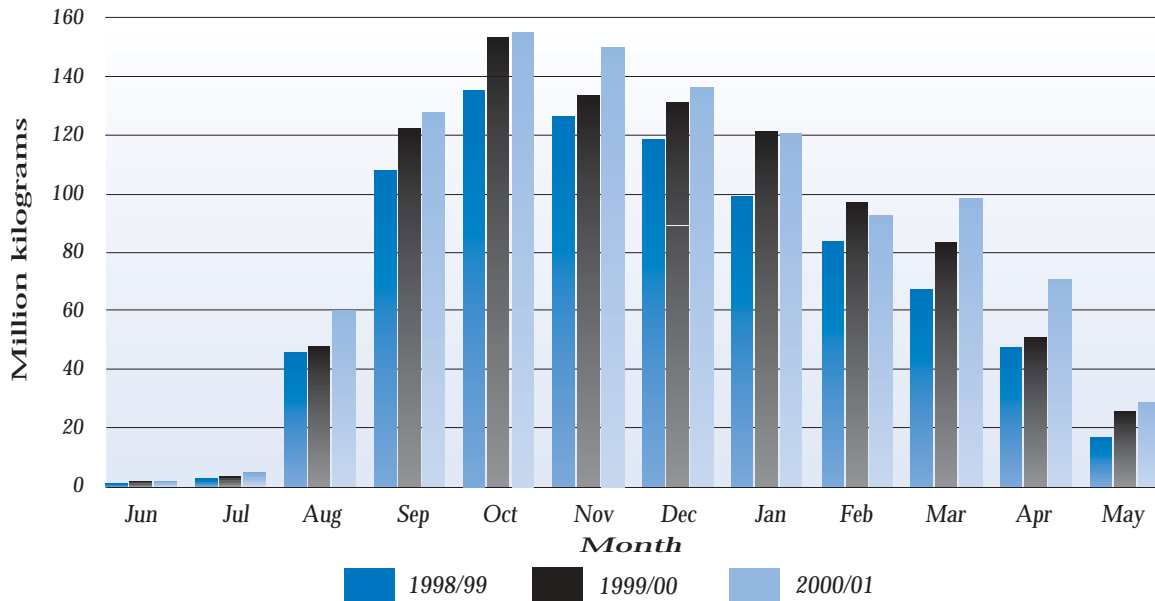
NOTE: Protein figures for 1974/75 to 1981/82 and milksolids figures for 1974/75 to 1990/91 are derived from milkfat figures



National dairy statistics – Industry statistics – Population

Comparing the 2000/01 season milksolids curve to the previous two seasons (Graph 2.1), the 2000/01 season production was higher than in the previous two seasons particularly for the last three months. Consistent with previous seasons, production peaked in October. Production throughout the season generally maintained a higher level than in the previous season, resulting in record production.

Graph 2.1 Seasonal trend in total milksolids processed



ii) Population

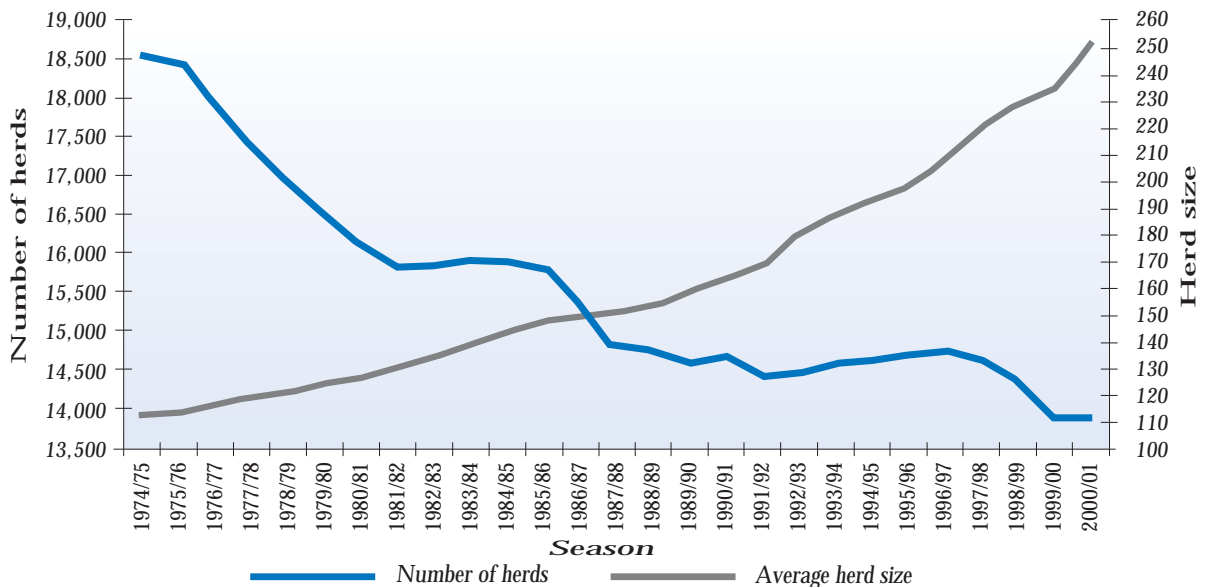
- Number of herds remain constant
- Continued increase in average herd size
- Vigorous increase in cow numbers

6

Sharp reductions in herd numbers followed by periods of stability or slight increases are characteristic of the long-term trend (Graph 2.2). The total number of herds in the 2000/01 season was comparable with the previous season indicating retardation to the strong decline of recent seasons.

The average herd size increased to 251 in 2000/01, continuing the consistent upward trend since 1974/75. The average herd size is now double that of twenty years ago.

Graph 2.2 Trend in the number of herds and average herd size since 1974/75



The total cow population increased in the 2000/01 season to 3.486 million (Table 2.2), a 6.6% increase from 3.269 million cows in 1999/00. A similar percentage increase was last recorded in 1992/93. Average effective hectares increased from 93 in 1999/00, to 96 in 2000/01; consistent with the upward trend since the early 1980s. An average of 2.7 cows per hectare remains equivalent to the previous two seasons.

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

Table 2.2 Summary of herd statistics since 1974/75

Season	Herds	Total cows	Average herd size	Average effective hectares*	Average cows per hectare*
1974/75	18,540	2,079,886	112	–	–
1975/76	18,442	2,091,950	113	–	–
1976/77	17,924	2,074,443	116	–	–
1977/78	17,363	2,052,624	118	–	–
1978/79	16,907	2,039,902	121	–	–
1979/80	16,506	2,045,808	124	–	–
1980/81	16,089	2,027,096	126	–	–
1981/82	15,821	2,060,898	130	63	2.1
1982/83	15,816	2,128,199	135	64	2.2
1983/84	15,932	2,209,725	139	65	2.2
1984/85	15,881	2,280,273	144	64	2.4
1985/86	15,753	2,321,012	147	64	2.4
1986/87	15,315	2,281,849	149	65	2.4
1987/88	14,818	2,236,290	151	65	2.4
1988/89	14,744	2,269,073	154	66	2.4
1989/90	14,595	2,313,822	159	67	2.4
1990/91	14,685	2,402,145	164	70	2.4
1991/92	14,452	2,438,641	169	–	–
1992/93	14,458	2,603,049	180	74	2.5
1993/94	14,597	2,736,452	188	77	2.5
1994/95	14,649	2,830,977	193	80	2.5
1995/96	14,736	2,935,759	199	82	2.5
1996/97	14,741	3,064,523	208	86	2.5
1997/98	14,673	3,222,591	220	87	2.6
1998/99	14,362	3,289,319	229	91	2.7
1999/00	13,861	3,269,362	236	93	2.7
2000/01	13,892	3,485,883	251	96	2.7

– Not available

* Average effective hectares and average cows per hectare for 1981/82 to 1990/91 are based on factory supply herds only



B. Farm production statistics

■ Production per farm, per hectare and per cow show substantial increases

Farm production has typically increased since 1992/93 (Table 2.3). An exception was evident in 1998/99 where production dropped markedly due to unfavourable weather conditions. Average milksolids per farm increased in 2000/01, consistent with increasing average farm size. Average milksolids per effective hectare increased 7.4% over the previous season. Production per cow increased in 2000/01 to an average of 310 kg milksolids (177kg milkfat and 133kg of protein).

Table 2.3 Summary of farm production since 1974/75

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

– not available

* 1991/92 figures include some town milk herds

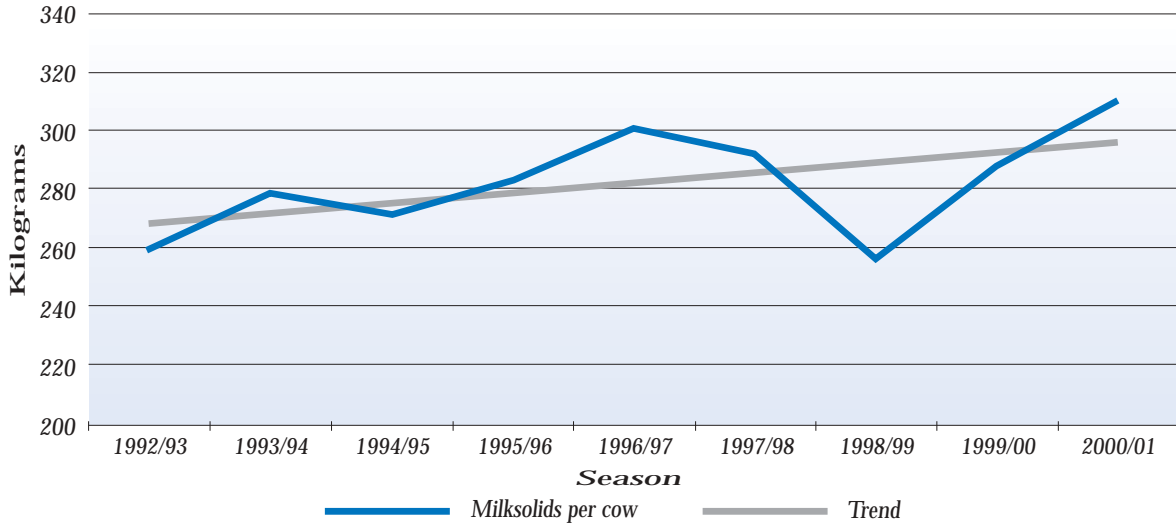
** 1992/93 to 1998/99 figures include all town milk herds



i) Production per cow

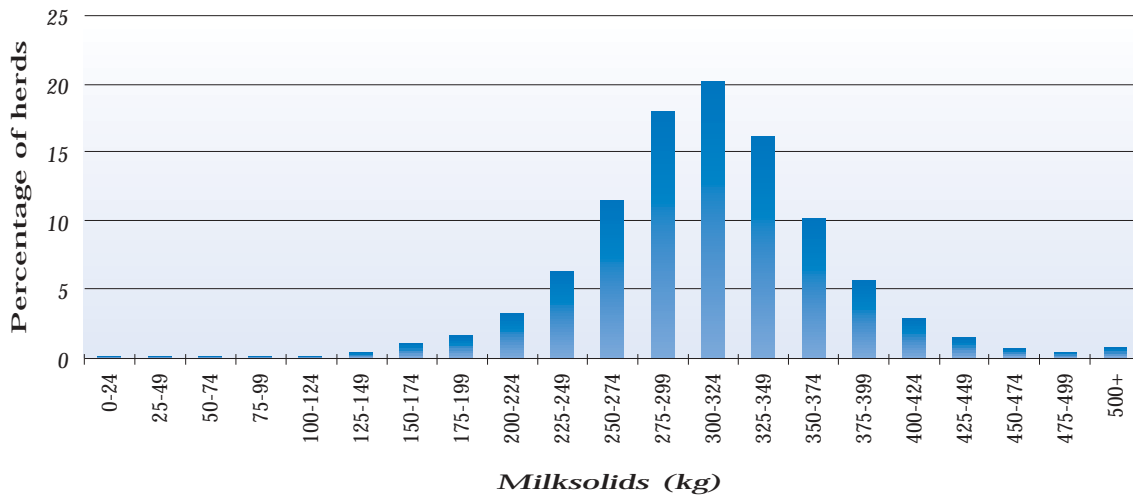
The trend of increased production per cow over the last nine seasons (Graph 2.3) is due to genetic gain and improvements in farm management. These improvements from season to season are masked by the considerable effect of the weather on each season's actual production. For example, unfavourable weather conditions in 1998/99 caused production per cow to fall to its lowest level since 1992/93.

Graph 2.3 Trend in milksolids production per cow since 1992/93



Production per cow varies considerably from farm to farm. The variation is caused by many factors, including geographic location, stocking rate, genetic merit of the herd and farm management practice. About 20% of herds produce between 300–324 kg of milksolids and approximately 75% produce between 250 and 375 kg of milksolids (Graph 2.4).

Graph 2.4 Distribution of herds by milksolids production per cow in 2000/01



Farm production statistics – Herd size distribution

ii) Herd size distribution

■ 26% of herds have 300 or more cows

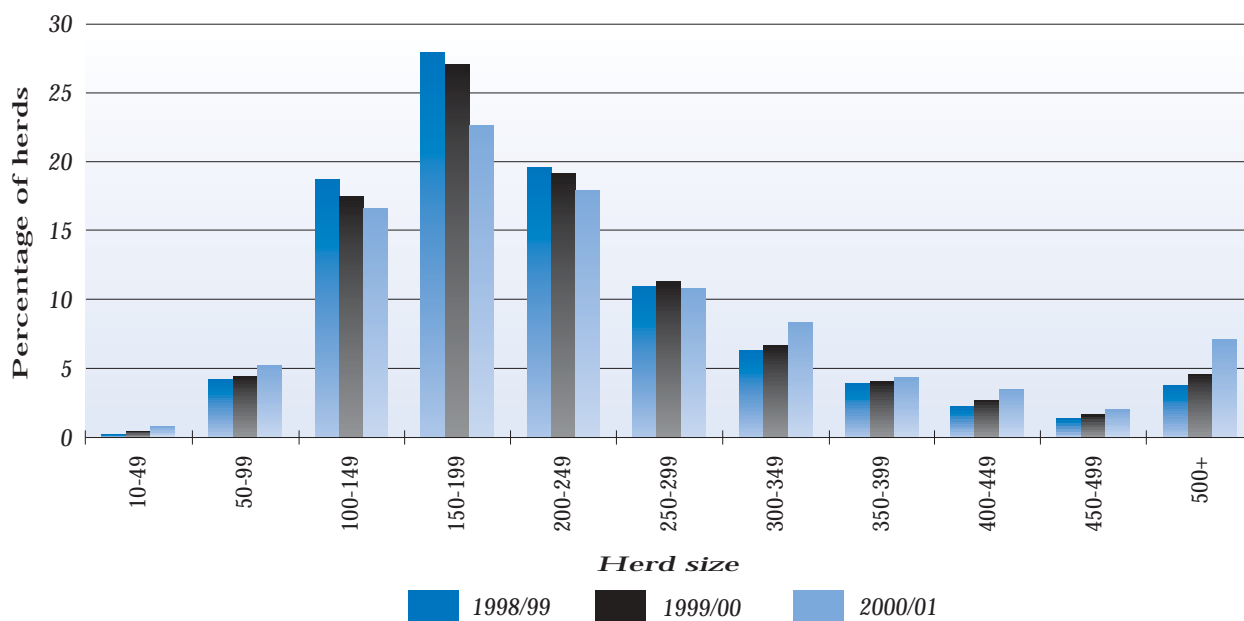
The average dairy herd size in 2000/01 was 251 cows. The number of herds with 300 or more cows has been increasing since 1970/71, except for a minimal decrease in 1998/99 (Table 2.4). In 2000/01, about 3,600 herds (25.9%) had 300 or more cows.

Table 2.4 Herds with 300 or more cows

Season	1980/81	1990/91	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Percentage of total herds	1.5	6.5	14.3	16.3	18.6	18.2	20.1	25.9

The herd size distribution presented in Graph 2.5 shows a steady increase in large herds (300+ cows) and a decrease in herds with less than 250 cows over the last 3 seasons. Despite dwindling herds of less than 250 cows, the most common herds continue to range between 150 and 199 cows.

Graph 2.5 Herd size distribution for last three seasons

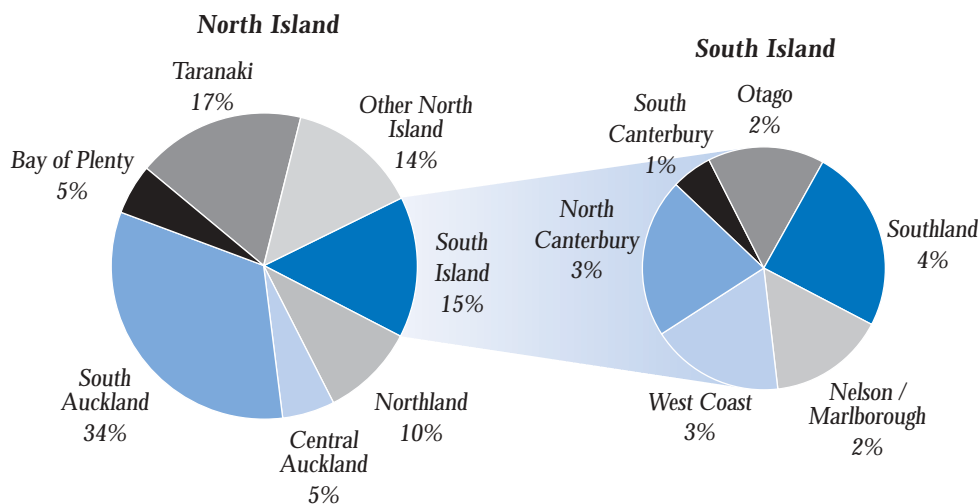


3. Regional dairy statistics

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

The vast majority (85%) of dairy farms are located in the North Island, with the greatest concentration (34%) situated in the South Auckland region. Taranaki with 17% of dairy farms is the next most heavily populated region. South Island dairy farms account for 15% of the national total. The distribution of dairy farms within regions of each island in 2000/01 (Graph 3.1) has remained similar to previous seasons.

Graph 3.1 Regional distribution of dairy farms in 2000/01



Regional dairy statistics

- **Over 1 million cows in South Auckland region**
- **Largest average herd size and average effective hectares in South Canterbury**
- **Average herd size in the South Island reaches 354**

Farms in the South Island are, on average, larger than those in the North Island, in terms of both physical size and cow numbers. The number of herds in both islands remains similar to last season, with some fluctuation within the regions (Table 3.1). Seventy-nine percent of the total cows are in the North Island, with 30% in the South Auckland region. The average herd size in both islands continues to increase. Within the South Island, South Canterbury has the largest average herd size with 483 cows, up slightly from the previous season's figure of 473 cows. In the North Island, Hawkes Bay has the largest average herd size with 428 cows. The smallest herds are in Central Auckland, Taranaki and Northland, averaging 194, 212 and 215 cows respectively. South Canterbury continues to have the highest average cows per hectare (3.0), followed by South Auckland (2.9). The lowest average cows per hectare are found at the West Coast (2.0) and Northland (2.1).

Table 3.1 2000/01 Herd analysis by region

Farming region	Total herds	Total cows	Average herd size	Average effective hectares	Average cows per hectare
Northland	1,414	303,958	215	102	2.1
Central Auckland	731	141,558	194	84	2.4
South Auckland	4,578	1,033,608	226	79	2.9
Bay of Plenty	760	185,329	244	87	2.8
Central Plateau	506	179,763	355	138	2.7
Western Uplands	84	24,076	287	115	2.5
East Coast	16	4,243	265	105	2.6
Hawkes Bay	65	27,791	428	148	2.7
Taranaki	2,343	495,609	212	78	2.7
Wellington	679	185,608	273	107	2.6
Wairarapa	608	157,214	259	98	2.7
North Island	11,784	2,738,757	232	88	2.7
Nelson/Marlborough	342	81,378	238	94	2.5
West Coast	365	89,116	244	124	2.0
North Canterbury	445	196,472	442	156	2.8
South Canterbury	121	58,390	483	164	3.0
Otago	308	117,782	382	144	2.7
Southland	527	203,988	387	147	2.6
South Island	2,108	747,126	354	137	2.6
New Zealand	13,892	3,485,883	251	96	2.7



■ Highest per farm production recorded in South Canterbury

South Island farms have, on average, higher per farm production, with South Canterbury recording the highest average farm production at 169,102 kilograms of milk solids (Table 3.2). These figures are consistent with the South Canterbury region having the largest average herd size. In the North Island, the Hawkes Bay region recorded the highest average farm production with 140,676 kilograms of milk solids.

In 2000/01 average production per effective hectare and per cow was higher in the South Island than the North Island. As with average production per farm, South Canterbury recorded the highest average milk solids per hectare (1,024 kg) in the South Island, while Hawkes Bay dominated average milk solid production in the North Island (896 kg).

However, Southland has the highest average milk solids per cow (369 kg). The lowest average milk solids per cow was recorded in the Nelson/Marlborough region (279 kg).

Table 3.2 2000/01 Farm production analysis by region

Farming region	Average litres per farm	Average milkfat per farm	Average protein per farm	Average milk solids per farm	Average milkfat per effective hectare	Average protein per effective hectare	Average milk solids per effective hectare	Average milkfat per cow	Average protein per cow	Average milk solids per cow
Northland	763,820	36,466	27,379	63,845	360	270	629	167	125	292
Central Auckland	680,053	32,134	24,202	56,336	392	295	687	167	125	292
South Auckland	825,233	40,267	29,876	70,143	508	376	884	178	132	310
Bay of Plenty	909,779	42,938	32,161	75,099	494	369	863	176	132	308
Central Plateau	1,353,319	64,619	47,950	112,569	490	362	853	186	137	323
Western Uplands	1,016,558	49,273	36,487	85,761	431	319	750	171	127	297
East Coast	947,697	40,481	32,449	72,930	455	367	823	172	139	311
Hawkes Bay	1,671,352	79,494	61,181	140,676	507	389	896	185	141	326
Taranaki	715,309	36,926	27,255	64,182	479	353	832	174	129	303
Wellington	1,005,035	47,175	36,196	83,371	446	342	788	171	131	303
Wairarapa	915,192	44,811	33,723	78,534	461	346	807	173	130	303
North Island	836,329	40,773	30,413	71,186	469	349	818	175	130	305
Nelson/Marlborough	796,661	38,317	28,531	66,849	411	305	715	160	119	279
West Coast	898,565	45,680	32,965	78,645	379	272	652	189	136	325
North Canterbury	1,863,466	87,237	67,530	154,767	542	420	962	197	153	350
South Canterbury	2,031,511	95,173	73,930	169,102	576	448	1,024	195	152	347
Otago	1,622,064	75,282	58,783	134,065	519	405	924	195	152	347
Southland	1,697,943	80,155	62,575	142,730	545	425	969	207	162	369
South Island	1,456,310	69,043	53,068	122,111	492	376	868	192	147	338
New Zealand	930,407	45,063	33,850	78,914	472	353	825	177	133	310

South Taranaki continues to be the district with the most herds (1,365) and cows (306,180) (Table 3.3). Waimate in South Canterbury has the highest average herd size, with 630 cows and largest average effective hectares (222).



Regional dairy statistics

Table 3.3 2000/01 Herd analysis by district

Region	District	Total herds	Total cows	Average herd size	Average effective hectares	Average cows per hectare
Northland	Far North	410	80,610	197	97	2.1
	Whangarei	463	109,214	236	109	2.2
	Kaipara	541	114,134	211	101	2.2
Central Auckland	Rodney	270	51,918	192	90	2.2
	Manukau City	28	5,833	208	79	2.6
	Papakura	13	2,568	198	72	2.8
South Auckland	Franklin	420	81,239	193	80	2.4
	Waikato	895	203,036	227	83	2.7
	Hamilton City	13	2,818	217	81	2.7
	Waipa	755	180,639	239	82	2.9
	Otorohanga	464	119,755	258	90	2.9
	Thames-Coromandel	117	25,167	215	86	2.5
	Hauraki	545	110,260	202	77	2.6
	Matamata-Piako	1,351	281,929	209	69	3.0
	South Waikato	438	110,004	251	87	2.9
	Bay of Plenty	Western Bay of Plenty	262	68,578	262	90
Tauranga		10	2,580	258	88	2.8
Kawerau/Whakatane		380	89,763	236	86	2.8
Opotiki		108	24,408	226	83	2.7
Central Plateau	Taupo	124	61,767	498	200	2.6
	Rotorua	382	117,996	309	117	2.7
Western Uplands	Waitomo	68	19,621	289	114	2.6
	Ruapehu	16	4,455	278	119	2.4
East Coast	Gisborne	7	1,737	248	104	2.5
	Wairoa	9	2,506	278	106	2.7
Hawkes Bay	Napier/Hastings	24	10,325	430	147	2.7
	Central Hawkes Bay	41	17,466	426	149	2.8
Taranaki	New Plymouth	608	120,079	197	78	2.6
	Stratford	370	69,350	187	74	2.6
	South Taranaki	1,365	306,180	224	79	2.9
Wellington	Wanganui	29	8,378	289	118	2.5
	Rangitikei	95	28,723	302	114	2.7
	Manawatu	307	81,647	266	103	2.6
	Palmerston North City	43	14,201	330	128	2.6
	Horowhenua	163	44,533	273	107	2.6
	Kapiti Coast	33	6,716	204	87	2.4
Wairarapa	Upper Hutt City	9	1,410	157	76	2.1
	Tararua	389	93,067	239	91	2.7
	Masterton	22	7,045	320	121	2.7
	Carterton	88	22,531	256	97	2.6
	South Wairarapa	109	34,571	317	121	2.7
North Island		11,784	2,738,757	232	88	2.7
Nelson/Marlborough	Marlborough	88	16,939	192	78	2.4
	Kaikoura	31	10,020	323	123	2.6
	Nelson City	6	1,000	167	69	2.4
	Tasman	217	53,419	246	97	2.6
West Coast	Buller	126	30,744	244	109	2.3
	Grey	71	20,974	295	150	2.0
	Westland	168	37,398	223	125	1.8



Regional dairy statistics

Table 3.3 continued

Region	District	Total herds	Total cows	Average herd size	Average effective hectares	Average cows per hectare
North Canterbury	Hurunui	49	28,118	574	203	2.9
	Waimakariri	72	18,413	256	112	2.3
	Christchurch City	10	2,510	251	86	2.8
	Banks Peninsula	16	2,195	137	79	1.8
	Selwyn	151	60,962	404	145	2.7
	Ashburton	147	84,274	573	186	3.1
South Canterbury	Timaru/MacKenzie	77	30,684	398	131	3.0
	Waimate	44	27,706	630	222	2.8
Otago	Waitaki/Central Otago	83	39,529	476	166	2.9
	Dunedin City	89	21,774	245	102	2.4
	Clutha	136	56,479	415	157	2.7
Southland	Gore	70	30,265	432	158	2.7
	Invercargill	43	14,780	344	139	2.4
	Southland	414	158,943	384	146	2.6
South Island		2,108	747,126	354	137	2.6
New Zealand		13,892	3,485,883	251	96	2.7

NOTE: Districts with fewer than five farms have been added to a neighbouring district to preserve the anonymity of the farms

Waimate district has the highest average production per farm with 222,330 kilograms of milksolids (Table 3.4). Ashburton district recorded the highest average kilograms of milksolids per effective hectare (1,043), whereas the highest production per cow was recorded in Invercargill and Southland (372 kg of milksolids). The North Island district with the highest production is Taupo, with an average of 154,439 kilograms of milksolids per farm.

Table 3.4 2000/01 Farm production analysis by district

Region	District	Average litres per farm	Average kg milkfat per farm	Average kg protein per farm	Average kg milksolids per farm	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	697,141	32,807	24,809	57,615	339	256	594	162	122	284
	Whangarei	863,293	41,970	31,372	73,342	389	290	679	176	132	308
	Kaipara	729,223	34,528	25,909	60,438	351	263	614	163	122	285
Central Auckland	Rodney	651,792	32,030	23,600	55,630	361	265	626	166	122	288
	Manukau City	794,433	35,122	27,407	62,529	443	345	788	172	134	306
	Papakura	677,036	30,879	23,679	54,558	420	319	739	154	117	271
	Franklin	690,688	32,040	24,391	56,431	408	310	717	167	127	294
	South Auckland	Waikato	842,064	40,263	30,267	70,531	484	362	846	177	133
South Auckland	Hamilton City	711,427	36,557	26,387	62,944	462	329	791	168	120	288
	Waipa	887,001	43,131	32,057	75,188	524	387	911	180	134	314
	Otorahanga	947,843	46,218	34,218	80,437	516	381	897	180	133	313
	Thames-Coromandel	756,656	36,102	26,962	63,064	426	317	743	167	125	292
	Hauraki	757,178	36,704	27,331	64,034	477	354	831	182	135	317
	Matamata-Piako	737,789	36,803	27,028	63,831	529	387	916	176	129	305
	South Waikato	930,579	45,375	33,547	78,922	523	386	909	180	133	313
	Bay of Plenty	Western Bay of Plenty	915,445	43,875	32,687	76,562	487	362	849	171	127
Bay of Plenty	Tauranga	893,330	41,708	31,447	73,155	440	329	769	157	117	274
	Kawerau/Whakatane	933,550	43,460	32,749	76,210	510	384	895	182	137	320
	Opotiki	813,915	38,938	28,879	67,818	456	336	792	168	124	293
Central Plateau	Taupo	1,841,919	88,660	65,779	154,439	472	348	820	183	135	318
	Rotorua	1,194,716	56,815	42,163	98,978	496	367	863	187	138	325
Western Uplands	Waitomo	1,010,317	49,431	36,355	85,785	435	319	754	170	125	295
	Ruapehu	1,043,084	48,604	37,052	85,656	414	317	732	174	133	307



Regional dairy statistics

Table 3.4 continued

Region	District	Average litres per farm	Average kg milkfat per farm	Average kg protein per farm	Average kg milksolids per farm	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
East Coast	Gisborne	970,295	40,753	32,990	73,743	468	379	847	184	149	332
	Wairoa	930,120	40,269	32,028	72,298	445	358	804	163	132	295
Hawkes Bay	Napier/Hastings	1,776,065	84,089	64,540	148,629	507	390	897	188	144	332
	Central Hawkes Bay	1,610,056	76,805	59,215	136,020	507	388	895	182	140	322
Taranaki	New Plymouth	690,214	35,268	25,989	61,257	456	336	792	178	131	310
	Stratford	671,797	33,964	25,373	59,337	463	345	808	180	135	315
	South Taranaki	738,282	38,468	28,330	66,798	493	363	856	171	126	297
Wellington	Wanganui	1,052,828	48,255	37,325	85,580	410	316	726	163	125	288
	Rangitikei	1,127,371	54,940	41,634	96,574	484	367	851	182	138	320
	Manawatu	985,469	46,491	35,585	82,076	451	345	796	172	132	304
	Palmerston North City	1,230,692	57,602	44,280	101,882	461	351	812	172	131	304
	Horowhenua	971,271	44,762	34,589	79,351	433	334	767	167	129	296
	Kapiti Coast	801,084	35,063	27,633	62,697	412	325	737	169	134	303
	Upper Hutt City	508,372	23,333	17,883	41,216	309	238	547	151	116	267
	Tararua	866,532	42,988	32,205	75,192	475	355	830	178	133	311
Wairarapa	Masterton	1,248,323	58,885	45,029	103,915	490	372	862	183	139	321
	Carterton	869,537	41,359	31,300	72,660	423	320	742	161	122	282
	South Wairarapa	1,058,470	51,264	38,814	90,078	438	330	768	162	123	285
North Island		836,329	40,773	30,413	71,186	469	349	818	175	130	305
Nelson/Marlborough	Marlborough	647,190	30,063	22,281	52,344	378	279	657	152	112	264
	Kaikoura	1,170,972	56,041	42,096	98,137	461	347	809	178	135	313
	Nelson City	705,864	30,790	23,725	54,515	456	351	807	190	146	336
	Tasman	806,313	39,341	29,261	68,602	416	307	723	160	119	279
West Coast	Buller	891,647	44,794	32,372	77,165	412	296	708	182	131	313
	Grey	1,094,587	53,914	39,603	93,517	369	269	637	183	133	317
	Westland	820,910	42,865	30,605	73,470	359	257	616	198	141	339
North Canterbury	Hurunui	2,359,131	110,603	85,165	195,769	556	428	984	192	147	339
	Waimakariri	1,154,070	52,082	40,653	92,735	469	368	837	206	162	368
	Christchurch City	1,094,287	48,412	37,808	86,220	541	424	965	195	153	349
	Banks Peninsula	451,454	20,603	15,753	36,356	264	202	466	150	114	264
	Selwyn	1,807,811	84,023	65,300	149,323	554	432	986	206	161	368
	Ashburton	2,308,887	109,863	84,762	194,625	589	454	1,043	189	146	335
South Canterbury	Timaru/MacKenzie	1,691,595	77,816	60,871	138,686	583	457	1,040	192	150	342
	Waimate	2,626,365	125,547	96,783	222,330	562	434	996	200	155	355
Otago	Waitaki/Central Otago	2,100,085	97,760	76,091	173,851	581	452	1,034	201	156	357
	Dunedin City	1,070,624	48,306	37,851	86,157	470	368	837	195	152	347
	Clutha	1,691,200	79,217	61,920	141,136	512	401	914	191	150	341
Southland	Gore	1,813,358	84,673	66,131	150,804	543	423	966	198	154	352
	Invercargill	1,579,535	74,148	58,171	132,319	503	393	896	209	163	372
	Southland	1,690,727	80,015	62,431	142,446	549	428	977	209	163	371
South Island		1,456,310	69,043	53,068	122,111	492	376	868	192	147	338
New Zealand		930,407	45,063	33,850	78,914	472	353	825	177	133	310

NOTE: Districts with fewer than five farms have been added to a neighbouring district to preserve the anonymity of the farms



4. Herd improvement

A. Use of herd testing

Farmers had the choice of two herd testing options in 2000/01. They were able to choose between Self Sample Service (where the farmer does the sampling using equipment supplied by Livestock Improvement), and Self Sample Assist (where the farmer does the sampling using equipment supplied by Livestock Improvement and Livestock Improvement provides an assist officer). All herd test systems are based on measured yields obtained over a 24-hour period, with samples collected from consecutive evening and morning milkings.

Farmers were able to choose the frequency of testing. If farmers tested four or more times a season, they received information on individual cow's milk, milkfat and protein yields, milkfat and protein percentages, and somatic cell count information. Also included is the Production Worth, which takes account of each lactation of the cow as well as the date of calving, age, stage of lactation and Breeding Worth. With higher frequencies of herd testing, the estimates of absolute lactation yields are more reliable. (See section 4D for Animal Evaluation statistics).

Farmers who opted for two or three tests during the season received Production Worth for individual cows but did not receive estimated lactation yields for milk, milkfat, or protein. Production Worth information is sufficient for farmers to cull for low production.

■ **83% of herds undertake herd testing in 2000/01**

The regional uptake of herd testing services in 2000/01 is shown in Table 4.1, where the number of cows tested refers to all cows tested at least once in the season. Bay of Plenty/East Coast and Taranaki regions have the highest percentage of herds using herd testing with 86.9% and 86.7% respectively. Bay of Plenty/East Coast region at 89.5% reported the highest number of cows herd tested.

Table 4.1 Use of herd testing by region in 2000/01

Livestock Improvement Region	Herds tested	Total herds	% of total herds	Cows tested	Total cows	% of total cows
Northland	1,278	1,682	76.0	285,286	354,821	80.4
Auckland	4,608	5,629	81.9	1,129,259	1,328,111	85.0
Bay of Plenty/East Coast	670	771	86.9	167,514	187,243	89.5
Taranaki	2,037	2,350	86.7	430,390	495,869	86.8
Wellington/Hawkes Bay	1,107	1,352	81.9	301,747	372,713	81.0
South Island	1,772	2,108	84.1	627,372	747,126	84.0
New Zealand	11,472	13,892	82.6	2,941,568	3,485,883	84.4



Herd improvement – Use of herd testing

The percentage of total herds using herd testing decreased slightly to 82.6% in 2000/01 (Table 4.2). This figure is down 4.6% from the highest percentage of herd testing set in 1996/97. Although a record number of cows were tested (2.94 million), the percentage of total cows tested (84.4%) weakened against the previous season.

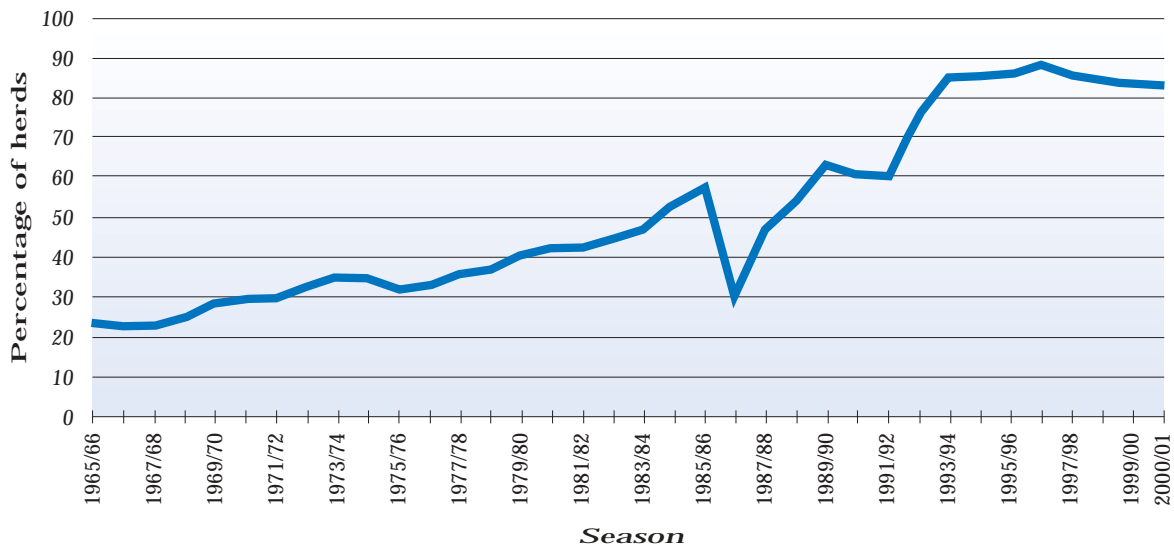
Table 4.2 Trend in the use of herd testing services since 1955/56

Season	Number of herds	% of total herds	Number of cows (000)	% of total cows
1955/56	7,469	21.0	476	23.8
1960/61	7,006	22.5	494	25.6
1965/66	6,206	23.5	521	25.0
1966/67	5,730	22.7	501	23.5
1967/68	5,724	23.1	538	24.1
1968/69	6,089	24.7	601	26.1
1969/70	6,768	28.4	700	30.2
1970/71	6,574	29.3	716	32.0
1971/72	6,274	29.6	690	31.4
1972/73	6,771	32.6	772	35.3
1973/74	6,640	34.7	780	36.4
1974/75	6,436	34.7	779	37.5
1975/76	5,858	31.8	706	33.7
1976/77	5,945	33.2	725	34.9
1977/78	6,159	35.5	771	37.6
1978/79	6,250	37.0	801	39.3
1979/80	6,662	40.4	871	42.6
1980/81	6,789	42.2	909	44.8
1981/82	6,702	42.4	922	44.7
1982/83	7,018	44.4	995	46.8
1983/84	7,430	46.6	1,092	49.4
1984/85	8,445	53.2	1,294	56.7
1985/86	9,026	57.3	1,484	63.9
1986/87	4,555	29.7	753	33.0
1987/88	6,930	46.8	1,175	52.5
1988/89	7,932	53.8	1,341	59.1
1989/90	9,213	63.1	1,604	69.3
1990/91	8,918	60.7	1,566	65.2
1991/92	8,661	59.9	1,611	66.1
1992/93	10,843	75.0	2,039	78.3
1993/94	12,372	84.8	2,377	86.9
1994/95	12,446	85.0	2,474	87.4
1995/96	12,620	85.6	2,592	88.3
1996/97	12,851	87.2	2,746	89.6
1997/98	12,510	85.3	2,826	87.7
1998/99	12,059	84.0	2,819	85.7
1999/00	11,521	83.1	2,806	85.8
2000/01	11,472	82.6	2,942	84.4



The trend in the percentage of total herds using herd testing continues to decrease slightly from the peak reached in the 1996/97 season (Graph 4.1).

Graph 4.1 Trend in the percentage of herds testing since 1965/66



B. Herd test averages

The lactation yield figures in this section are for cows herd tested. Season and breed averages (parts i and iii) are calculated on lactation yields for herds that tested four or more times during the season. Monthly averages (part ii) are calculated on lactation yields for herds that tested at least once during the season, and only cows that lactated for one hundred days or more were included in herd test averages. In comparison, the average milksolids figures given in Chapters 2 and 3 (national and regional dairy statistics respectively) are based on all herds supplying a dairy company, regardless of whether herd testing was used, and represent the average production per cow as supplied to the dairy company. Therefore, production figures reported using each of these methods will differ.

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

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



Herd improvement – Herd test averages – Season averages

i) Season averages

- **South Island has highest herd test production**

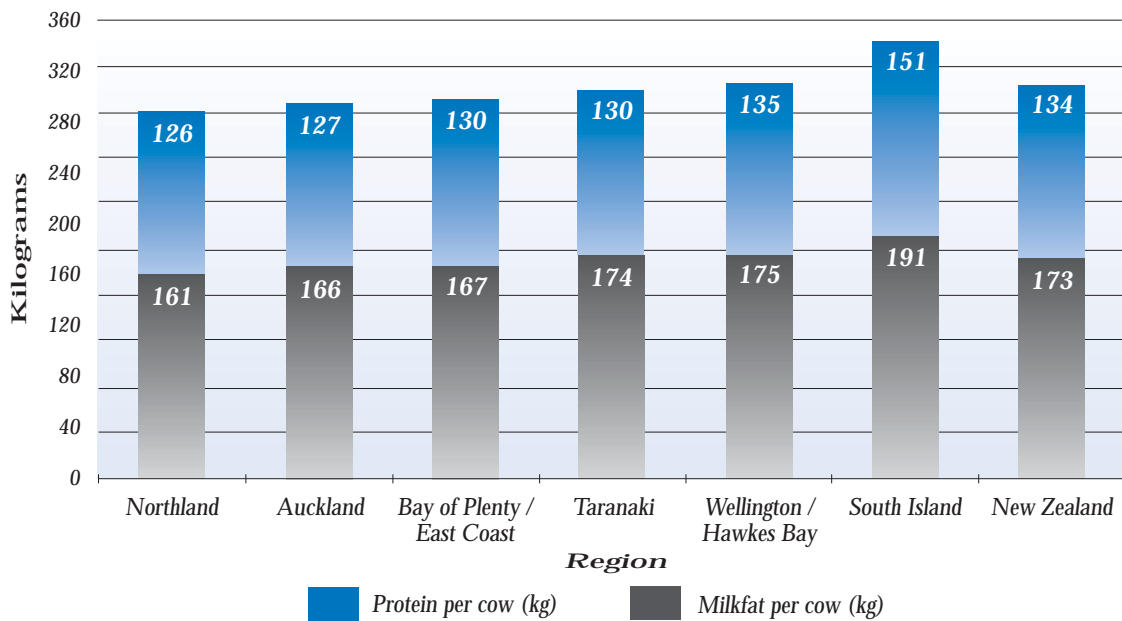
Average per cow statistics for each Livestock Improvement region is summarised in Table 4.3. The additional information for the days in milk (production) more accurately reflects the lactation length by using milk supply information from seasonal suppliers. The South Island recorded the highest per cow per day milk volume (4,190 litres), milkfat (191 kg) and protein (151 kg) of cows herd tested. Taranaki recorded the highest milkfat and protein percentages.

Table 4.3 2000/01 Season herd test averages per cow by region

Livestock Improvement Region	Milk (litres)	Milkfat (kg)	Milkfat (%)	Protein (kg)	Protein (%)	Somatic cell count (000 cells/millilitre)	Days in milk (herd testing)	Days in milk (production)
Northland	3,555	161	4.53	126	3.53	202	226	291
Auckland	3,561	166	4.66	127	3.56	180	227	272
Bay of Plenty / East Coast	3,719	167	4.50	130	3.50	216	224	267
Taranaki	3,444	174	5.10	130	3.78	199	224	259
Wellington / Hawkes Bay	3,775	175	4.65	135	3.58	211	224	275
South Island	4,190	191	4.54	151	3.57	218	221	244
New Zealand	3,706	173	4.68	134	3.59	196	224	268

The 2000/01 milkfat and protein lactation regional averages of herd tested cows (Graph 4.2) shows some variability in values between all regions, with milkfat production ranging from 161 (Northland) to 191 kg per cow (South Island) and protein production from 126 (Northland) to 151 kg per cow (South Island).

Graph 4.2 Average milkfat and protein production per cow in 2000/01



■ Increase in production per cow for 2000/01

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

Additional information for the days in milk figure has been included for the last three seasons. The days in milk (production) figure calculates average lactation length by using seasonal milk supply information. The decrease in the average somatic cell count per millilitre of milk from 1992/93 to 1997/98, as shown in Table 4.4, is due to a number of factors, including industry pressure for improved milk quality, farm management practice, and climatic conditions. The 2.6% increase in somatic cell count (000 cells per millilitre) recorded in 1998/99 can be attributed to unfavourably dry climatic conditions during the latter half of the season.

Table 4.4 Trend in the national herd test averages since 1970/71

Season	Milk (litres)	Milkfat (kg)	Milkfat (%)	Protein (kg)	Protein (%)	Days in milk (herd test)	Days in milk (production)	Somatic cell count (000 cells/millilitre)
1970/71	2,809	134	4.77	–	–	–	–	–
1971/72	3,089	146	4.73	–	–	–	–	–
1972/73	2,941	139	4.73	–	–	–	–	–
1973/74	2,797	135	4.83	–	–	–	–	–
1974/75	2,913	138	4.74	–	–	–	–	–
1975/76	3,112	149	4.79	–	–	–	–	–
1976/77	3,240	154	4.75	–	–	–	–	–
1977/78	3,027	142	4.69	–	–	–	–	–
1978/79	3,266	155	4.75	–	–	–	–	–
1979/80	3,380	162	4.79	–	–	–	–	–
1980/81	3,331	160	4.80	–	–	–	–	–
1981/82	3,326	159	4.78	–	–	–	–	–
1982/83	3,377	160	4.74	–	–	–	–	–
1983/84	3,451	165	4.78	–	–	–	–	–
1984/85	3,416	162	4.74	–	–	–	–	–
1985/86	3,424	161	4.78	–	–	247	–	–
1986/87	3,046	143	4.79	–	–	230	–	–
1987/88	3,300	156	4.81	–	–	235	–	–
1988/89	3,197	149	4.67	115	3.60	237	–	265
1989/90	3,221	152	4.72	117	3.66	235	–	358
1990/91	3,190	152	4.81	116	3.65	222	–	298
1991/92	3,361	162	4.83	124	3.70	226	–	282
1992/93	3,298	157	4.77	121	3.65	221	–	280
1993/94	3,560	171	4.84	131	3.69	223	–	216
1994/95	3,253	154	4.77	118	3.64	208	–	206
1995/96	3,501	164	4.72	126	3.60	224	–	206
1996/97	3,641	173	4.78	133	3.66	223	–	197
1997/98	3,373	158	4.67	119	3.52	209	266	195
1998/99	3,189	147	4.51	113	3.44	208	266	200
1999/00	3,601	169	4.69	130	3.58	221	263	193
2000/01	3,706	173	4.68	134	3.59	224	268	196

– not available



Herd improvement – Herd test averages – Monthly averages

ii) Monthly averages

■ Lowest Somatic Cell Count per cow per day recorded in Auckland region

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).

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

Table 4.5 2000/01 Monthly herd test averages by region

Average litres of milk per cow per day

Livestock Improvement Region	2000					2001					Season average		
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar		Apr	May
Northland	15.58	14.62	17.39	18.94	18.39	16.69	15.56	14.25	12.01	11.52	10.88	12.80	15.25
Auckland	16.70	17.19	20.11	20.64	19.66	17.61	15.90	13.51	11.32	11.63	9.79	10.20	15.24
B.O.P. / East Coast	16.30	15.25	19.67	21.28	20.38	18.80	16.77	14.16	11.73	12.37	10.87	11.61	16.06
Taranaki	16.41	18.93	19.21	19.78	18.91	17.49	16.66	13.70	12.19	10.32	8.77	10.30	14.88
Well. / Hawkes Bay	15.67	15.71	18.67	20.86	19.61	19.48	17.64	15.81	14.16	11.65	10.16	13.27	16.20
South Island	16.74	18.06	19.03	22.41	23.14	21.78	20.08	18.08	16.76	14.30	12.01	11.81	18.23
New Zealand	16.09	16.62	19.19	20.58	20.27	18.55	17.24	14.68	13.13	11.91	10.34	11.47	15.95

Average kg of milkfat per cow per day

Livestock Improvement Region	2000					2001					Season average		
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar		Apr	May
Northland	0.68	0.66	0.76	0.83	0.81	0.75	0.69	0.66	0.58	0.57	0.53	0.62	0.70
Auckland	0.70	0.74	0.89	0.92	0.88	0.81	0.72	0.64	0.55	0.59	0.52	0.54	0.71
B.O.P. / East Coast	0.70	0.67	0.86	0.92	0.88	0.83	0.73	0.64	0.55	0.61	0.56	0.56	0.72
Taranaki	0.78	0.84	0.92	0.95	0.91	0.87	0.82	0.71	0.65	0.58	0.52	0.56	0.76
Well. / Hawkes Bay	0.69	0.68	0.81	0.92	0.88	0.89	0.80	0.74	0.68	0.60	0.55	0.66	0.76
South Island	0.75	0.77	0.80	0.98	1.02	0.98	0.89	0.82	0.79	0.70	0.64	0.60	0.84
New Zealand	0.71	0.72	0.85	0.92	0.91	0.85	0.78	0.69	0.64	0.61	0.56	0.59	0.75

Average kg of protein per cow per day

Livestock Improvement Region	2000					2001					Season average		
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar		Apr	May
Northland	0.53	0.51	0.61	0.67	0.64	0.59	0.55	0.51	0.43	0.44	0.40	0.47	0.54
Auckland	0.56	0.59	0.73	0.74	0.69	0.63	0.56	0.48	0.40	0.44	0.39	0.41	0.55
B.O.P. / East Coast	0.55	0.52	0.71	0.75	0.70	0.66	0.58	0.48	0.40	0.46	0.42	0.45	0.57
Taranaki	0.58	0.65	0.72	0.73	0.69	0.67	0.63	0.52	0.46	0.42	0.37	0.42	0.57
Well. / Hawkes Bay	0.53	0.54	0.66	0.74	0.69	0.70	0.63	0.57	0.51	0.45	0.41	0.50	0.59
South Island	0.57	0.59	0.63	0.79	0.82	0.78	0.71	0.65	0.61	0.55	0.49	0.46	0.66
New Zealand	0.55	0.56	0.69	0.74	0.71	0.67	0.61	0.53	0.47	0.46	0.42	0.45	0.58

Average somatic cell count (000 cells per millilitre)

Livestock Improvement Region	2000					2001					Season average		
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar		Apr	May
Northland	187	200	189	179	182	171	188	198	212	233	266	270	202
Auckland	185	171	161	159	159	147	160	178	214	215	244	254	180
B.O.P. / East Coast	276	208	229	190	190	171	188	205	229	244	259	260	216
Taranaki	256	252	188	167	170	162	167	177	197	218	237	243	199
Well. / Hawkes Bay	201	207	210	185	205	190	201	196	226	234	258	264	211
South Island	218	227	215	219	206	201	204	211	209	234	242	261	218
New Zealand	201	206	182	173	178	166	178	188	212	224	246	258	196



iii) Breed averages

▪ **Holstein-Friesian/Jersey cross-bred cows show higher milkfat production**

Holstein-Friesian, Jersey, Ayrshire and Holstein-Friesian/Jersey cross-bred herd test statistics were analysed for the 2000/01 season. The breed averages listed in Table 4.6 are for cows herd tested four or more times during the season.

On average, Holstein-Friesian/Jersey cross-bred cows produced more milkfat than the other breeds listed, while Holstein-Friesian cows produced more protein and a higher volume of milk. Jerseys have the highest milkfat and protein percentages. In the Holstein-Friesian breed, seven-year-old cows produced more milk and five-year-olds produced more milkfat and protein than any other age group. Six-year-olds dominated production for Jerseys. Holstein-Friesian/Jersey cross-bred seven-year-old cows produced the most milk, five-year-olds the most milkfat and six-year-olds the most protein. For the Ayrshire breed, five-year-old cows had the highest average production.

Table 4.6 2000/01 Herd test breed averages by age of cow

Holstein-Friesian

Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milkfat (%)	Protein (%)
2	250,718	221	3,253	138.9	111.4	4.30	3.43
3	209,823	217	3,679	160.6	128.6	4.40	3.50
4	202,040	217	4,123	179.0	142.7	4.38	3.47
5	184,735	218	4,221	186.6	147.3	4.45	3.50
6	155,753	218	4,253	186.0	147.1	4.41	3.47
7	117,770	217	4,278	185.1	146.9	4.36	3.45
8	87,800	217	4,187	182.1	144.9	4.38	3.48
9	62,713	215	4,044	177.0	140.3	4.40	3.48
10+	79,775	210	3,734	163.9	128.6	4.41	3.45
Total	1,351,127	217	3,912	170.3	135.4	4.38	3.47

Jersey

Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milkfat (%)	Protein (%)
2	75,723	224	2,362	134.4	93.8	5.72	3.98
3	70,260	222	2,681	153.9	109.2	5.76	4.08
4	59,429	223	2,942	167.9	120.3	5.73	4.10
5	51,798	223	3,031	174.5	124.2	5.79	4.11
6	45,463	222	3,078	174.7	125.1	5.70	4.07
7	36,183	221	3,032	173.2	122.7	5.73	4.06
8	25,353	220	3,001	170.2	121.1	5.70	4.05
9	18,836	217	2,902	167.2	117.9	5.78	4.08
10+	25,728	213	2,735	156.7	110.8	5.75	4.06
Total	408,773	222	2,813	160.8	114.1	5.74	4.06

Holstein-Friesian/Jersey cross-bred (1st–2nd cross)

Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milkfat (%)	Protein (%)
2	131,040	223	2,935	145.5	108.1	5.00	3.70
3	120,403	221	3,337	167.5	126.2	5.06	3.80
4	82,749	220	3,719	183.1	138.7	4.97	3.75
5	69,364	221	3,853	191.4	144.2	5.01	3.76
6	62,460	221	3,908	191.1	144.8	4.93	3.72
7	46,035	220	3,927	189.9	143.9	4.88	3.69
8	33,848	220	3,854	186.1	141.8	4.87	3.70
9	26,306	218	3,730	181.9	137.8	4.92	3.71
10+	35,244	213	3,488	169.4	127.7	4.89	3.68
Total	607,449	221	3,519	173.5	130.8	4.98	3.73



Herd improvement – Herd test averages – Breed averages

Table 4.6 continued

Ayrshire

Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milkfat (%)	Protein (%)
2	5,126	227	2,912	128.1	103.0	4.42	3.54
3	4,767	222	3,309	145.5	118.3	4.42	3.58
4	4,418	221	3,640	159.2	130.0	4.39	3.58
5	3,840	223	3,881	168.6	137.9	4.37	3.56
6	3,368	219	3,880	166.1	137.1	4.30	3.54
7	2,757	222	3,872	166.6	136.7	4.32	3.53
8	2,019	219	3,777	162.1	133.6	4.31	3.54
9	1,560	221	3,831	164.1	135.3	4.30	3.53
10+	2,074	215	3,527	152.2	124.4	4.33	3.53
Total	29,929	222	3,553	154.3	126.1	4.37	3.55

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

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. Holstein-Friesian/Jersey cross-breeds and Ayrshires have similar average liveweights.

Table 4.7 Liveweight by age and breed of cow for 2000/01

Age	Holstein-Friesian		Jersey		Holstein-Friesian/Jersey		Ayrshire	
	Average liveweight (kg)	Number of cows	Average liveweight (kg)	Number of cows	Average liveweight (kg)	Number of cows	Average liveweight (kg)	Number of cows
2	410	16,075	315	5,594	370	8,724	363	228
3	458	2,313	362	855	426	2,112	431	26
4	497	2,035	385	756	451	1,527	451	24
5	517	1,584	406	647	475	1,248	484	21
6	524	1,300	405	541	481	956	487	11
7	528	892	418	387	488	719	491	12
8	536	708	414	283	493	434	488	11
9	533	519	418	190	489	349	493	8
10+	525	580	418	221	486	413	496	8
Total	446	26,006	348	9,474	413	16,482	400	349



C. Artificial Breeding (AB) statistics

■ 5.8% increase in the number of cows to AB for 2000/01

All artificial inseminations are recorded on the Livestock Improvement National Database. Table 4.8 provides a summary of cows mated to artificial breeding (AB) for the last nine seasons. The number of cows inseminated has increased every year, with the exception of 1998/99 which shows a minimal decrease of 0.1%. The percentage of cows to AB seems to have plateaued at around 80–85% for the last eight seasons (Graph 4.3). An increase in the number of yearlings to AB in the 2000/01 season contrasts with the general decline since 1995/96 (Table 4.8).

Table 4.8 Trend in Artificial Breeding (AB) use since 1992/93 by region: cows and yearlings to AB

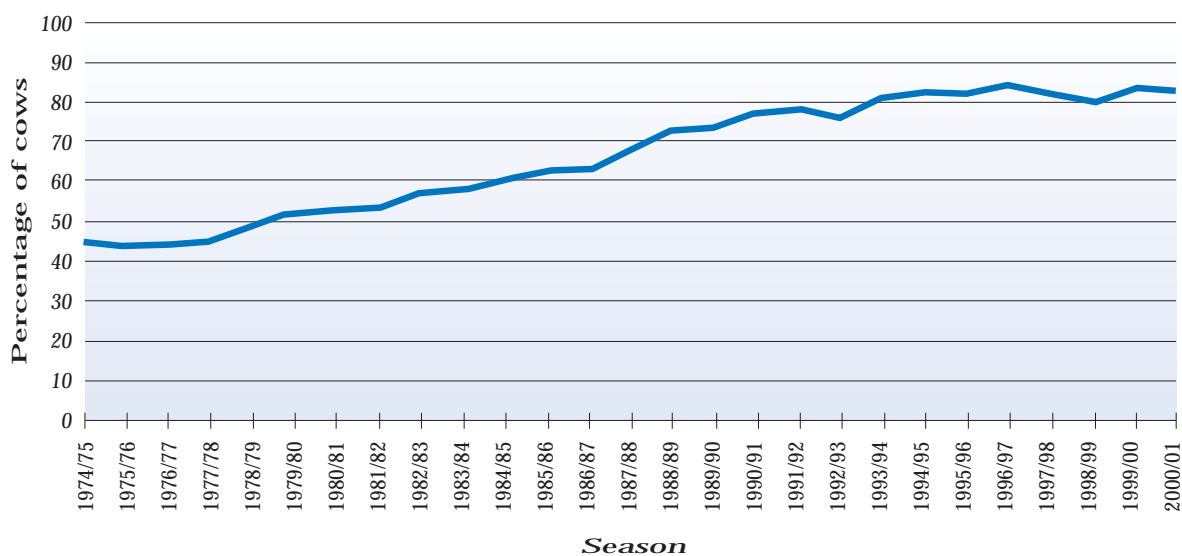
Cows to AB

Livestock Improvement Region	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Northland	216,772	249,293	253,662	257,557	262,429	258,057	244,115	246,617	257,752
Auckland	886,199	960,928	992,301	1,007,497	1,065,624	1,069,038	1,066,442	1,057,618	1,096,379
B.O.P. / East Coast	134,648	147,388	151,469	152,836	155,267	156,602	153,294	152,751	157,162
Taranaki	361,864	388,152	398,201	398,571	399,435	404,930	395,636	405,605	427,683
Well. / Hawkes Bay	174,192	204,054	220,471	230,582	254,002	266,514	266,171	276,517	294,387
South Island	206,475	266,201	319,949	371,210	437,078	483,968	510,514	587,957	660,075
New Zealand	1,980,150	2,216,016	2,336,053	2,418,253	2,573,835	2,639,109	2,636,172	2,727,065	2,893,438

Yearlings to AB

Livestock Improvement Region	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Northland	14,475	19,555	21,159	22,034	20,613	15,966	11,188	9,825	10,437
Auckland	32,608	42,856	54,867	53,038	48,291	31,102	25,968	21,804	24,543
B.O.P. / East Coast	8,582	13,286	16,773	17,501	15,753	10,317	7,854	7,250	8,492
Taranaki	11,989	15,740	19,099	17,864	11,909	8,428	5,748	5,700	7,698
Well. / Hawkes Bay	5,534	10,882	13,473	15,321	14,375	9,887	6,223	6,313	7,823
South Island	16,011	32,382	44,715	48,194	54,152	35,159	34,906	41,469	56,743
New Zealand	89,199	134,701	170,086	173,952	165,093	110,859	91,887	92,361	115,736

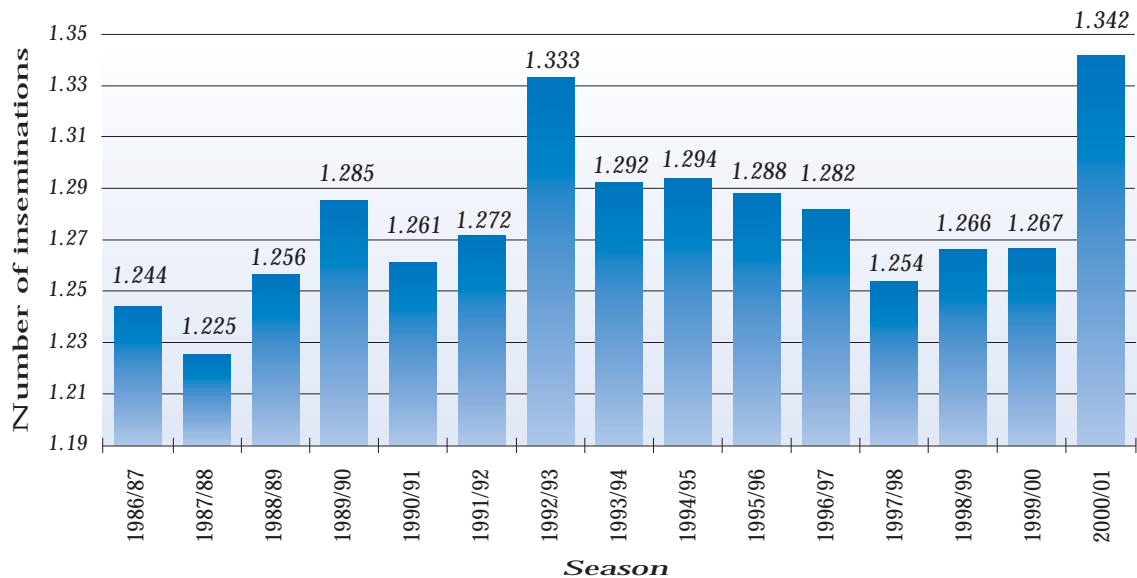
Graph 4.3 Trend in the percentage of cows to Artificial Breeding (AB) since 1974/75



Herd improvement – Artificial breeding statistics

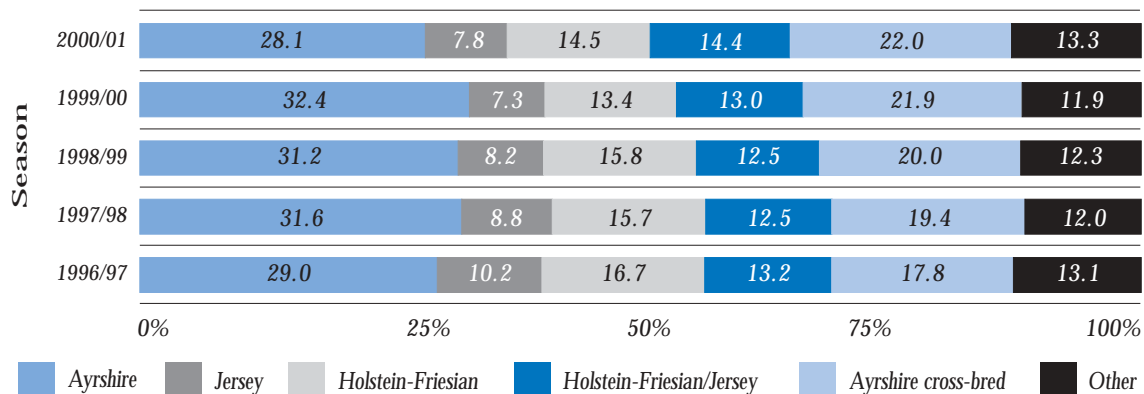
In 2000/01 the average number of inseminations per cow as recorded on the Livestock Improvement National Database increased to 1.34 from 1.27 in the previous two seasons (Graph 4.4). The average number of inseminations in 2000/01 was equivalent to that of the 1992/93 season (1.33).

Graph 4.4 Average number of inseminations per cow since 1986/87



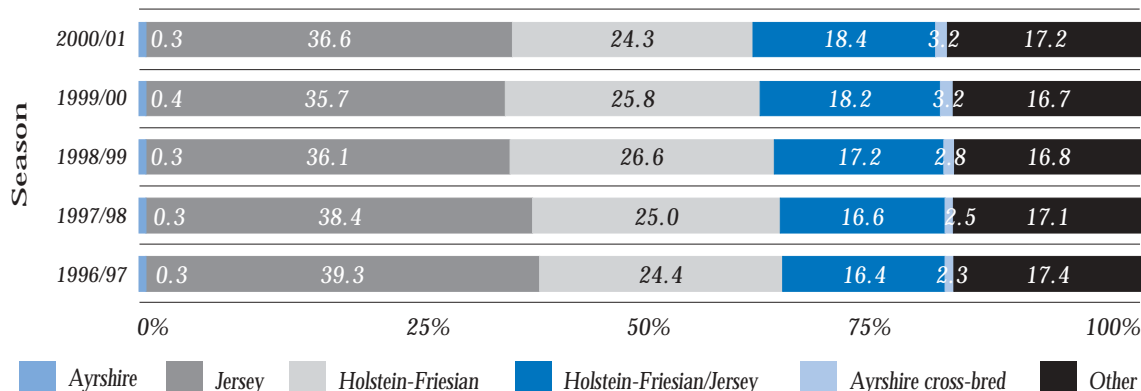
The use of Ayrshire, Holstein-Friesian and Jersey semen over different cow breeds for the five seasons from 1996/97 to 2000/01 is shown below. Ayrshire semen use over Ayrshire cows shows a drop to 28.1 (Graph 4.5). The use of Jersey semen over other breeds remains similar to the previous two seasons (Graph 4.6). The use of Holstein-Friesian semen over Holstein-Friesian cows continues to decrease, but increased slightly over other breeds (Graph 4.7).

Graph 4.5 Ayrshire semen usage (%) by cow breed since 1996/97

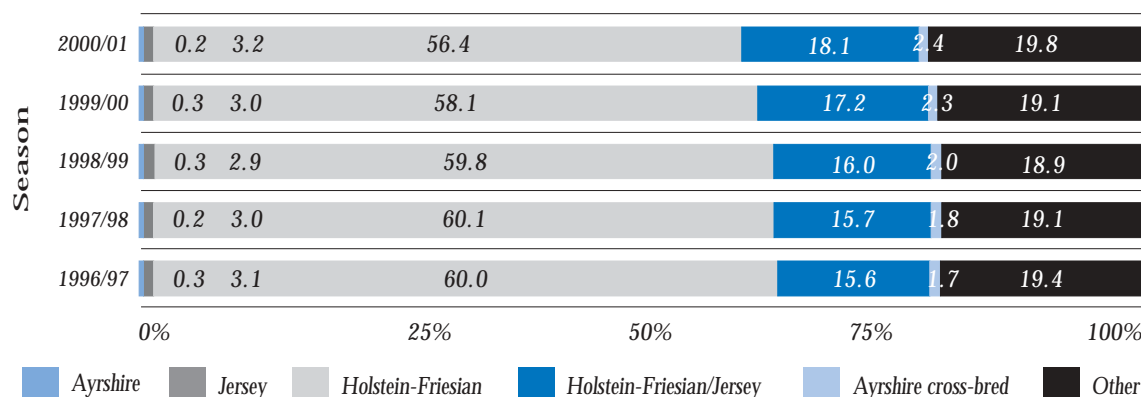


Herd improvement – Artificial breeding statistics

Graph 4.6 Jersey semen usage (%) by cow breed since 1996/97

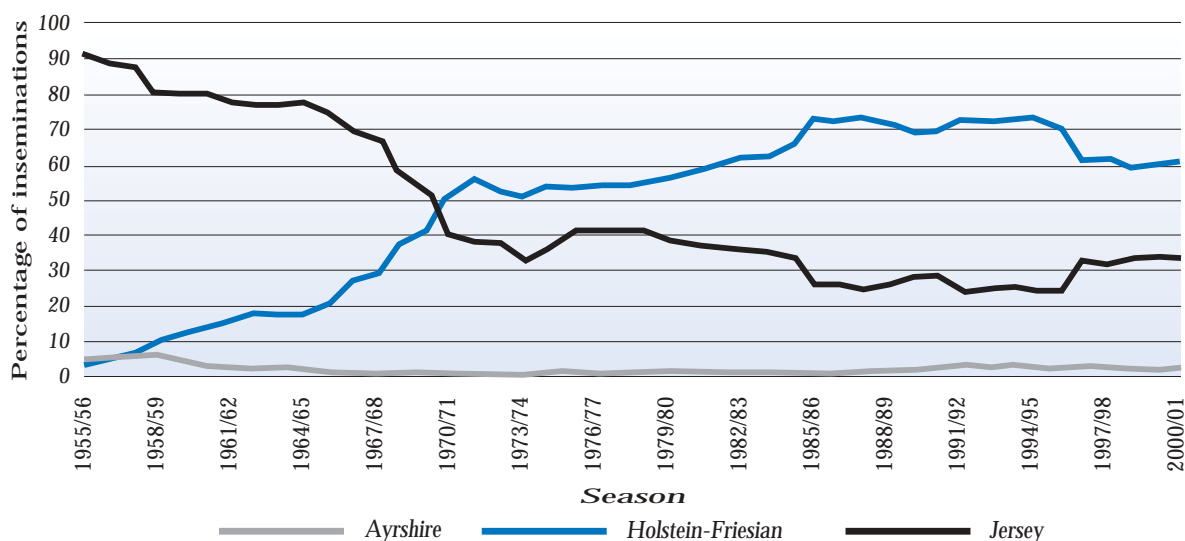


Graph 4.7 Holstein-Friesian semen usage (%) by cow breed since 1996/97



The percentage of inseminations for each major breed (Holstein-Friesian, Jersey and Ayrshire) as recorded on the Livestock Improvement National Database is shown in Graph 4.8. The percentage of inseminations for the three breeds is similar to that of last season.

Graph 4.8 Trend in the percentage of inseminations of each major breed since 1955/56



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 cross-bred 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 allow 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 a measure of an animal's genetic merit (*Breeding Values*), lifetime productive ability (*Production Values*) and current season productive ability (*Lactation Values*) for individual traits, including milkfat, protein, volume, liveweight, and longevity.
2. **Economic evaluations** combine an animal's individual trait evaluations to measure its ability to convert feed into profit, through breeding replacements (*Breeding Worth*), lifetime production (*Production Worth*) and current season production (*Lactation Worth*).

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

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

$$\begin{aligned}
 \text{Breeding Worth} &= \text{Milkfat BV} && \times && \text{\$EV Milkfat} && + \\
 &\text{Protein BV} && \times && \text{\$EV Protein} && + \\
 &\text{Milk BV} && \times && \text{\$EV Milk} && + \\
 &\text{Liveweight BV} && \times && \text{\$EV Liveweight} && + \\
 &\text{Longevity BV} && \times && \text{\$EV Longevity} &&
 \end{aligned}$$

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, ie it identifies those animals in a herd which are the most efficient converters of feed into profit. Breeding Worth (BW) and Production Worth (PW) are based on future price predictions for milk components, while Lactation Worth (LW) is based on predicted end of season prices. The economic values for 2000/01 are presented below (Table 4.9). The economic values are reviewed annually and therefore may change from year to year.

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Table 4.9 Economic values used from 3 March 2001

	Milkfat (\$/kg)	Protein (\$/kg)	Milk (\$/kg)	Liveweight (\$/kg)	Longevity (\$/day)
Breeding Worth	1.284	4.417	-0.059	-0.675	0.031
Production Worth	1.548	4.579	-0.063	-0.745	-
Lactation Worth	1.880	6.267	-0.082	-1.067	-

The information for all Animal Evaluation statistics was sourced from cows recorded on the Livestock Improvement National Database as at 19 May 2001, and from sires recorded on the Livestock Improvement National Database at 19 May 2001. Table 4.10 shows the Breeding Values (BV) and BW by breed, of all bulls born in 1996, first proven in the 2000/01 season with a reliability of 75% or greater.

Table 4.10 Average Breeding Values and Breeding Worth of 1996 born bulls (reliability of 75% or greater)

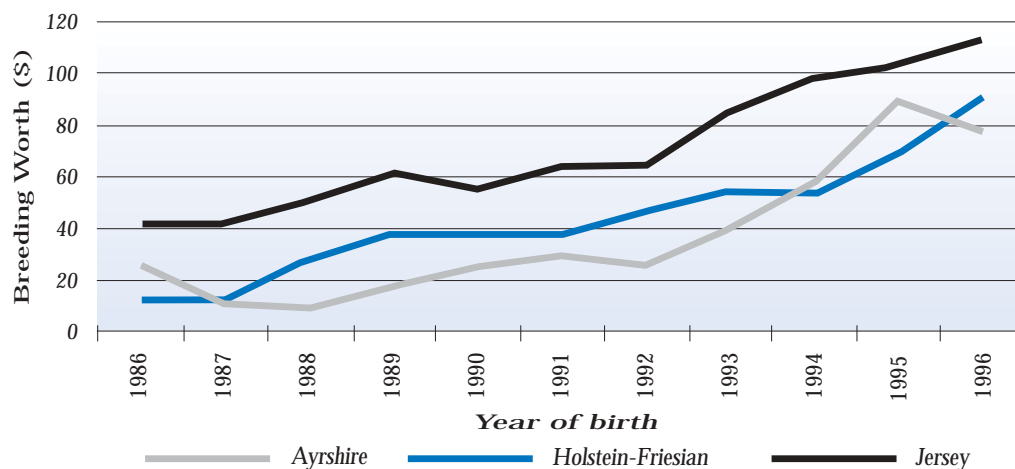
Breed	Milkfat BV	Protein BV	Milk Vol BV	Liveweight BV	Longevity BV	BW	Number of Sires
Ayrshire	16.4	21.0	576	9.3	86.6	76.3	13
Holstein Friesian	33.7	38.4	1190	76.4	17.0	91.6	196
Jersey	21.8	11.3	-13.2	-43.9	121.4	112.0	131

(Evaluation date: 19 May 2001)



The genetic trend of proven dairy bulls is shown in Graph 4.9. Bulls born in 1996 are first proven in the 2000/01 season.

Graph 4.9 Genetic trend of proven dairy bulls by year of birth (reliability of 75% or greater)



(Evaluation date: 19 May 2001)

Young bulls are initially selected for use in Artificial Breeding (AB) based on the genetic merit of their sire and dam. These young sires are then progeny tested to estimate their true Breeding Worth via the production 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 for which the reliability of the BW was at least 75%, grouped by birth year and breed. 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	Ayrshire	Other Breeds
1986	282	172	81	22	7
1987	320	194	94	18	14
1988	323	195	97	22	9
1989	369	217	116	20	16
1990	353	213	104	25	11
1991	380	243	99	27	11
1992	371	229	111	25	6
1993	337	200	107	26	4
1994	381	230	119	29	3
1995	394	231	120	36	7
1996	341	196	131	13	1

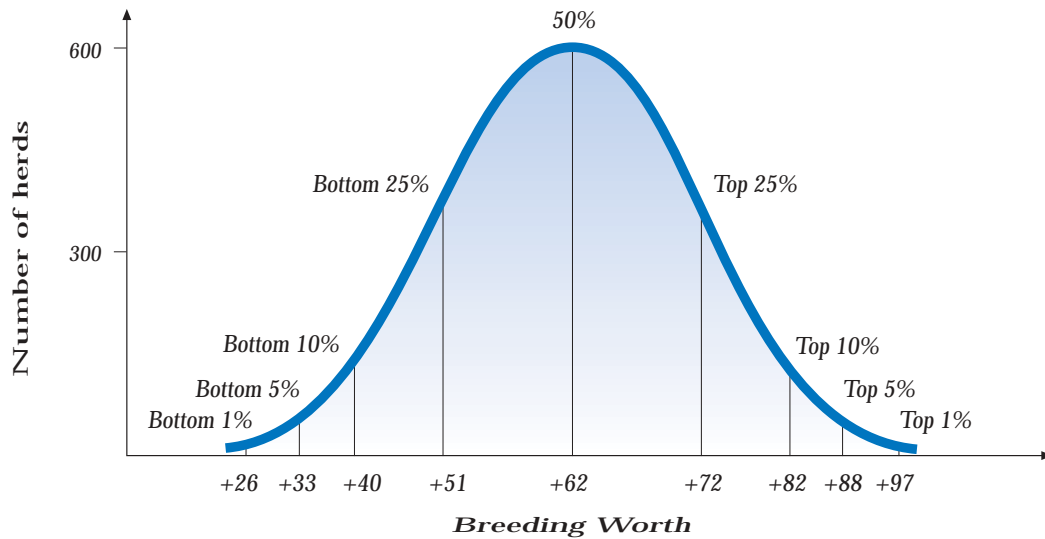
(Evaluation date: 19 May 2001)



Herd improvement - Animal evaluation

The distributions of BW and PW for herds presented below (Graphs 4.10, 4.11) are based on all cows recorded on the Livestock Improvement National Database with a test number in herds signed up for herd testing for the 2000/01 season. For example Graph 4.10 shows that 50% of New Zealand herds have a BW of 62 or above and that 25% of New Zealand herds have a BW of 72 or above.

Graph 4.10 Distribution of herd Breeding Worth (BW) in 2000/01

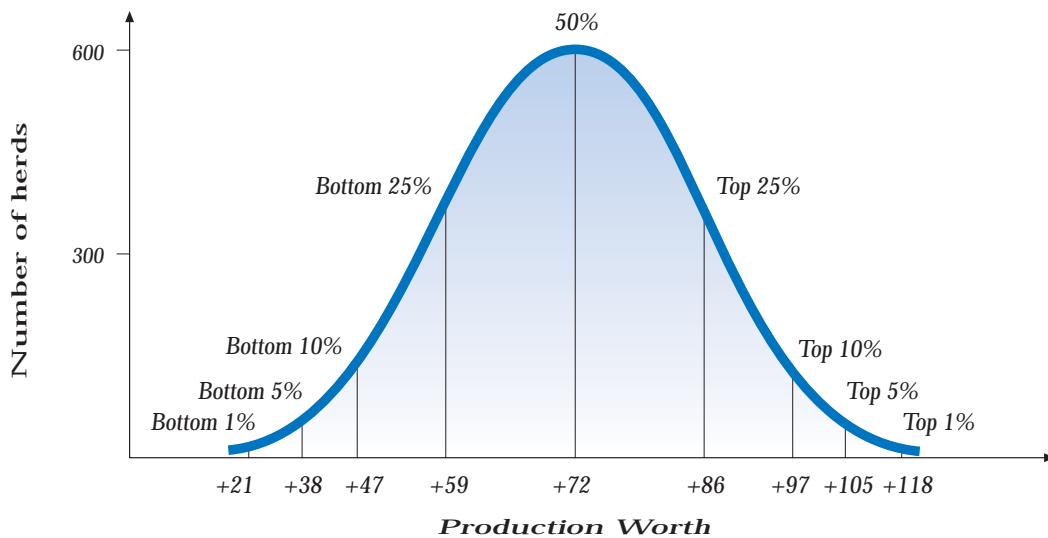


(Evaluation date: 19 May 2001)

The distribution graph for PW for herds in the 2000/01 season is based on all cows recorded with a test number in herds signed up for herd testing for 2000/01. Graph 4.11 shows that 50% of New Zealand herds have a PW of 72 or above, and that 25% of New Zealand herds have a PW of 86 or above.

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Graph 4.11 Distribution of herd Production Worth (PW) in 2000/01

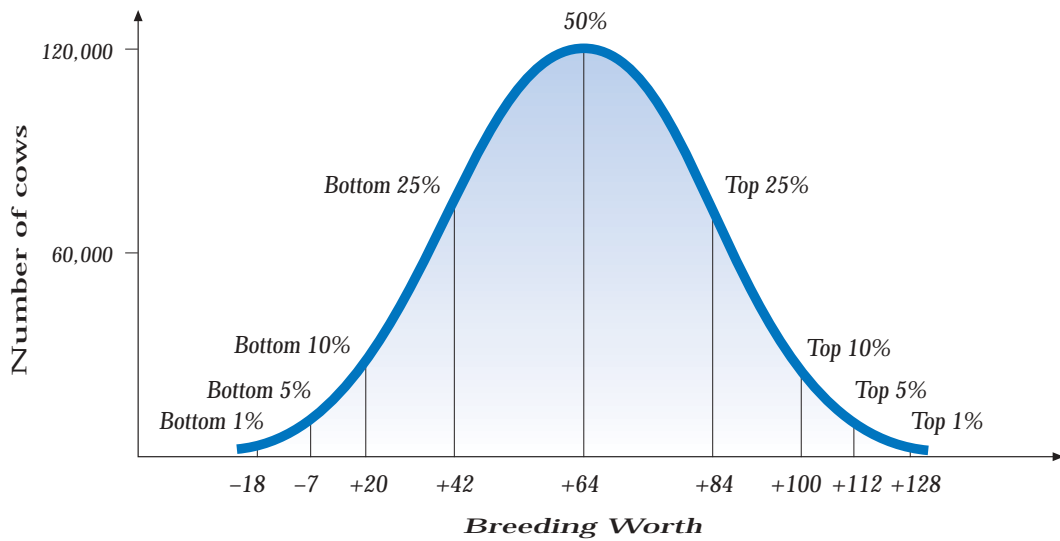


(Evaluation date: 19 May 2001)



The distribution graphs for cows presented below (Graphs 4.12, 4.13) are based on all cows recorded on the Livestock Improvement National Database with a test number in herds signed up for herd testing for the 2000/01 season. Graph 4.12 shows that 50% of New Zealand cows have a BW of 64 or above and that 25% of New Zealand cows have a BW of 84 or above.

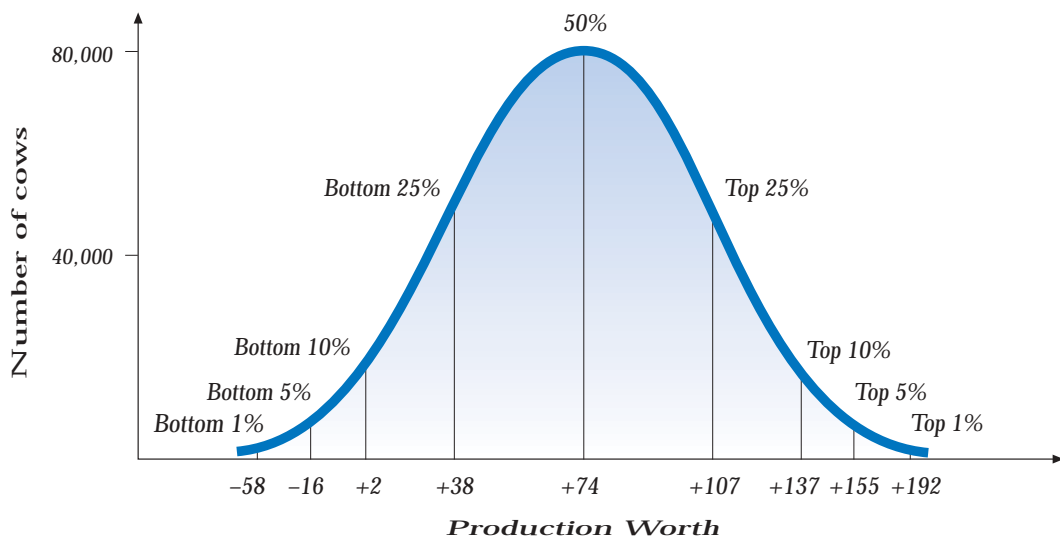
Graph 4.12 Distribution of cow Breeding Worth (BW) in 2000/01



(Evaluation date: 19 May 2001)

The distribution graph for cows presented below (Graph 4.13) is based on all cows recorded with a test number in herds signed up for herd testing for the 2000/01 season. Graph 4.13 shows that 50% of New Zealand cows have a PW of 74 or above and that 25% of New Zealand cows have a PW of 107 or above.

Graph 4.13 Distribution of cow Production Worth (PW) in 2000/01



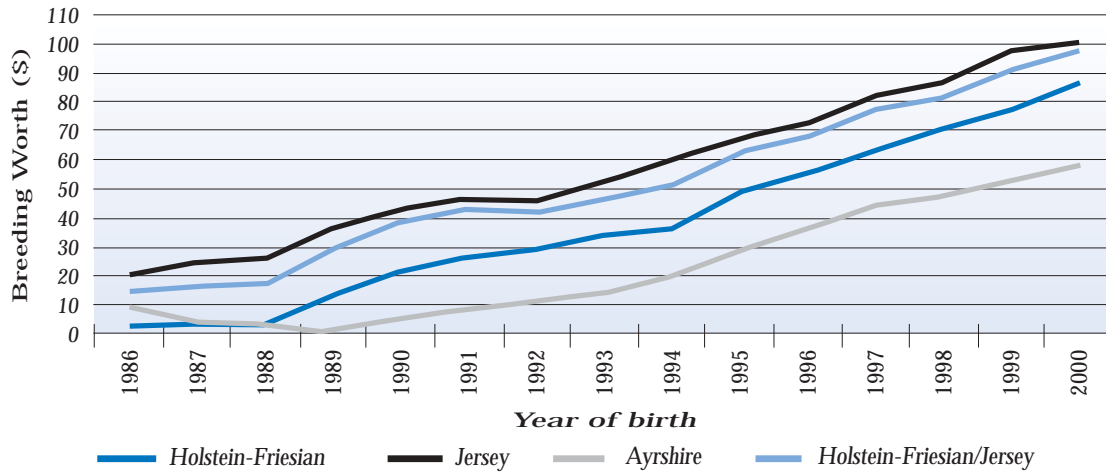
(Evaluation date: 19 May 2001)



Herd improvement - Animal evaluation

The genetic trend for cows is based on all cows (alive or dead) recorded on the Livestock Improvement National Database in the 2000/01 season. Also included are the estimated BW and PW for replacement stock (1999 and 2000 born animals). All evaluations can be compared across breeds. The genetic trend for BW by breed is presented in Graph 4.14. The Breeding Worth for all breeds has increased over time.

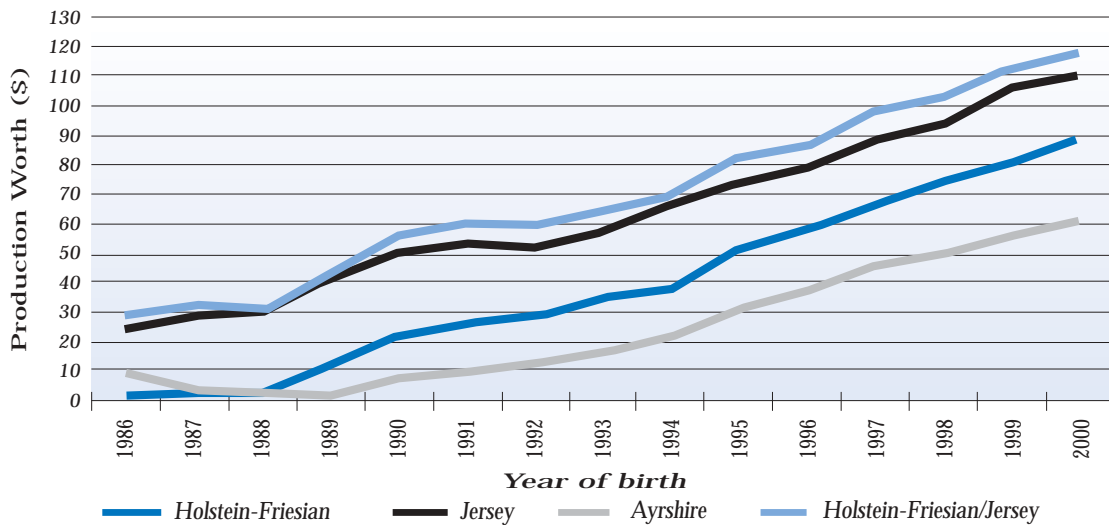
Graph 4.14 Genetic trend in Breeding Worth (BW) for all cows in 2000/01



(Evaluation date: 19 May 2001)

The trend for PW by breed is presented in Graph 4.15. Holstein-Friesian/Jersey cross-breeds have maintained a higher PW over other breeds, caused by the effect of heterosis (hybrid vigour) in the cross-breeds.

Graph 4.15 Trend in Production Worth (PW) for all cows in 2000/01



(Evaluation date: 19 May 2001)



Table 4.12 shows the average BV and BW by breed, of all 1998 born cows. The Jersey breed has the highest BW at 87.3. The Holstein-Friesian cows have the highest milkfat, protein, and milk volume BVs. All evaluations are comparable across breeds.

Table 4.12 Average Breeding Worth (BW) and Breeding Value (BV) of all cows by breed born in 1998

Breed	BW \$	Milkfat BV (kg)	Protein BV (kg)	Milk BV (l)	Liveweight BV (kg)	Longevity BV (%)	Cow numbers
Holstein-Friesian	71.1	26.4	28.5	901	55.6	68	434941
Jersey	87.3	17.2	6.1	-98	-43.8	90	126122
Ayrshire	48.0	9.8	15.4	469	8.9	39	10437
Holstein-Friesian /Jersey	82.7	23.4	17.6	400	6.1	99	193917
Guernsey	-15.6	-2.4	2.6	70	19.0	-226	169
Milking Shorthorn	-4.4	-3.0	6.3	192	20.9	-83	955
Brown Swiss	-22.3	-5.1	8.0	226	46.7	-201	180
Other	57.9	16.1	16.7	462	14.8	27	26832
Weighted Average	75.6	23.6	21.7	598	25.7	77	

(Evaluation date: 19 May 2001)

Survivability is measured by the percentage of cows that have a lactation recorded for consecutive years. The 2000/01 2-3 years figure is the percentage of cows that were milking as two-year-olds in the 1999/00 season and are now milking as three-year-olds in the 2000/01 season. Table 4.13 shows that for the 2000/01 season the highest percentage of survival is in animals ageing from 3-4 years (86.7%), followed closely by animals ageing from 4-5 years (86.5%).

Table 4.13 Survivability percentages since 1996/97

Season	Percentage (%) of age group surviving to next lactation						
	2-3 years	3-4 years	4-5 years	5-6 years	6-7 years	7-8 years	8-9 years
1996/97	84.9	85.1	84.8	81.6	78.2	74.2	69.0
1997/98	85.9	86.7	85.6	81.9	77.7	73.9	68.3
1998/99	84.5	86.1	85.8	83.0	80.0	75.5	70.5
1999/00	84.1	86.2	85.8	82.8	80.7	76.3	70.8
2000/01	85.3	86.7	86.5	83.2	80.1	76.5	71.7



5. General statistics

A. Prices received by dairy farmers

i) Milksolids

The New Zealand Dairy Board pays dairy companies based on international commodity prices, and provides for a commodity margin after deductions have been made for milk and manufacturing costs. Extra payments (above base commodity prices) are made to dairy companies for products commanding a market premium, derived as a result of the manufacturing processes (i.e., certain value added products). The change in payment system came about in June 1998 as a result of the implementation of the Commercial Pricing Model payment system. Prior to this the New Zealand Dairy Board paid dairy companies for the export products they produced according to the market returns obtained for the various products, the cost of manufacture and the composition of each product (in terms of the amount of milksolids).

Each seasonal supply dairy company passes on the Dairy Board advance payout to its suppliers in addition to its own payout which is determined by dairy company efficiency, product mix and reinvestment policies; together this is known as the total payout.

Payments to seasonal supply farmers are based upon the “A+B–C” system, which incorporates payments for milkfat (A) and protein (B) with penalties for milk volume (C). The payment system for suppliers to town supply dairy companies varies between companies. Some town supply payment systems are based on the milk volume only, whereas other payment systems are similar to seasonal supply payment systems which incorporate components of milkfat, protein and volume.



■ Average dairy company total payout clears \$5.00

The average dairy company total payout (per kilogram of milksolids) received by dairy farmers from seasonal supply dairy companies is shown in Table 5.1. The average payout is given in both nominal and inflation adjusted dollars using the Consumer's Price Index based to June 1999.

Table 5.1 Trend in prices received for milksolids since 1973/74

Season	NZDB advance payout (\$/kg milksolids)	Average Dairy Company total payout (\$/kg milksolids)	Dairy Company payout (inflation adjusted)*
1973/74	-	0.76	5.96
1974/75	0.78	0.75	5.11
1975/76	0.81	0.83	4.81
1976/77	0.88	0.87	4.44
1977/78	0.96	0.98	4.46
1978/79	0.99	1.03	4.15
1979/80	1.20	1.22	4.19
1980/81	1.52	1.52	4.51
1981/82	1.91	1.95	4.94
1982/83	2.07	2.11	4.95
1983/84	2.01	2.09	4.69
1984/85	2.28	2.33	4.48
1985/86	2.30	2.29	3.98
1986/87	1.90	2.03	2.98
1987/88	2.07	2.34	3.22
1988/89	3.05	3.28	4.31
1989/90	3.33	3.59	4.39
1990/91	2.12	2.42	2.88
1991/92	2.98	3.34	3.94
1992/93	3.25	3.66	4.26
1993/94	2.90	3.32	3.82
1994/95	3.00	3.40	3.74
1995/96	3.60	3.99	4.30
1996/97	3.18	3.63	3.87
1997/98	3.00	3.42	3.58
1998/99	3.25	3.58	3.77
1999/00	3.35	3.78	3.90
2000/01	4.60	5.01	5.01

– Not available

* Weighted to give real dollar values using the Consumers Price Index (based to June 1999) for the end of the June quarter. Sourced from Statistics New Zealand

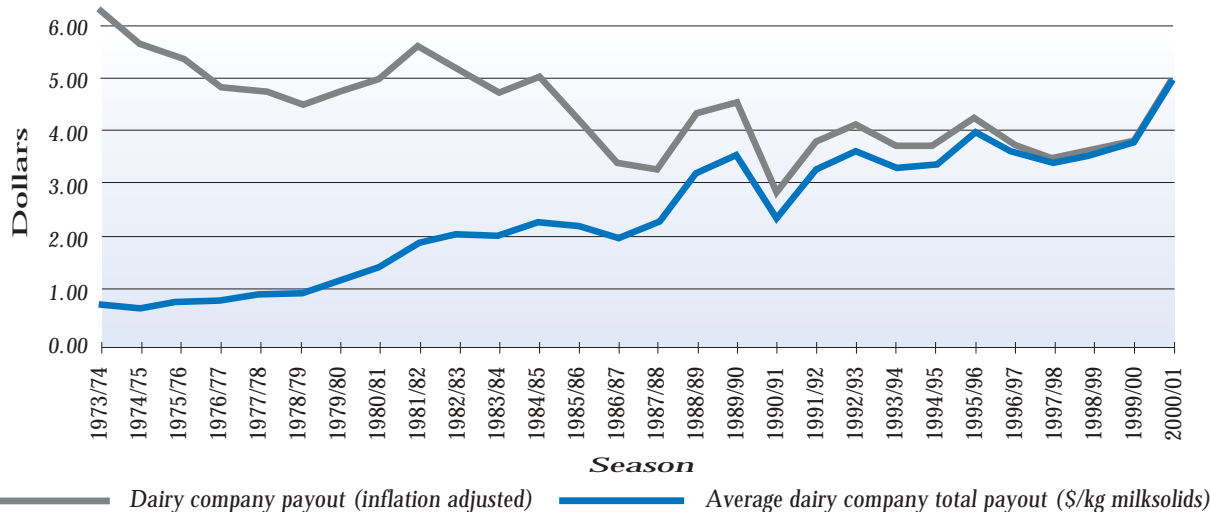
NOTE: Average Dairy Company total actual payout for 1974/75 to 1988/89 has been derived from \$/kg milkfat



General statistics – Prices received by dairy farmers – Dairy farm land sale values

- **Staggering 28% increase for inflation adjusted dairy company payout**

Graph 5.1 Trend in milksolids payout to dairy farmers since 1973/74



ii) Dairy farm land sale values

- **Average sale price of farms approaches \$1,000,000 mark**
- **Average price per hectare increases in contrast to previous seasons**

The average sale price of dairy farms continues to increase (Table 5.2). The average price per hectare sees a reversal in the trend of recent years and increased to just under \$13,000. The average dairy farm price per kilogram of milksolids continues to gain steadily.

Table 5.2 Trend in dairy land sale values since 1980

Year	Number of farms	Average sale price	Inflation adjusted average sale price ^a	Average hectares	Price per hectare	Inflation adjusted average price per hectare ^a	Price per kg milkfat ^b	Price per kg milksolids ^c
1980	1,256	146,065	499,372	55	2,650	9,060	11.2	6.4
1981	1,327	208,246	619,444	55	3,783	11,253	14.8	8.5
1982	813	276,042	700,415	52	5,309	13,471	21.3	12.2
1983	527	257,373	603,594	46	5,587	13,103	20.4	11.7
1984	618	301,076	674,538	49	6,189	13,866	21.9	12.6
1985	505	298,746	574,050	49	6,044	11,614	21.0	12.1
1986	274	251,165	437,152	47	5,298	9,221	18.4	10.6
1987	504	270,180	395,138	52	5,212	7,623	16.8	9.7
1988	576	278,650	383,053	56	5,013	6,891	16.0	9.2
1989	1,013	325,847	428,896	59	5,561	7,320	17.8	10.2
1990	868	373,553	456,854	58	6,467	7,909	21.8	12.5
1991	538	362,819	431,693	58	6,283	7,476	21.7	12.5
1992	897	446,979	526,475	62	7,183	8,461	23.1	13.3
1993	834	543,984	632,945	61	8,903	10,359	31.0	17.8
1994	784	704,245	810,459	61	11,640	13,396	37.5	21.6
1995	672	775,110	852,864	58	13,400	14,744	41.9	24.1
1996	784	785,510	847,482	60	13,187	14,227	41.6	23.9
1997	520	674,809	719,933	54	12,388	13,216	38.5	22.1
1998	496	704,309	738,683	64	11,076	11,617	32.0	18.4
1999	600	769,606	810,395	72	10,759	11,329	33.1	19.0
2000	576	856,374	884,080	80	10,740	11,087	35.3	20.3
2001 ^d	438	978,768	978,768	75	12,976	12,976	38.1	21.9

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

^a Adjusted using the Consumers Price Index (based to June 1999) 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 2001

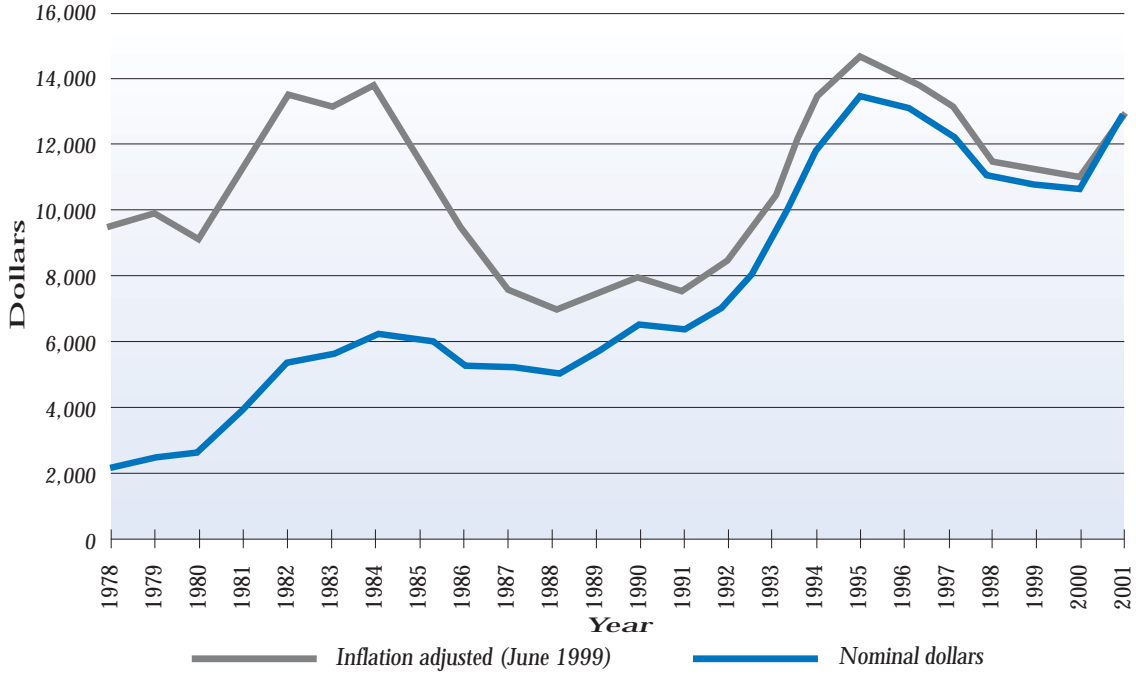


General statistics – Prices received by dairy farmers – Dairy farm land sale values

■ **Continued decrease in nominal price per hectare**

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. Since 1995 there has been a decrease in average price per hectare. These figures are based on the calendar year, not the dairy industry season.

Graph 5.2 Trend in dairy land values (price per hectare) since 1978



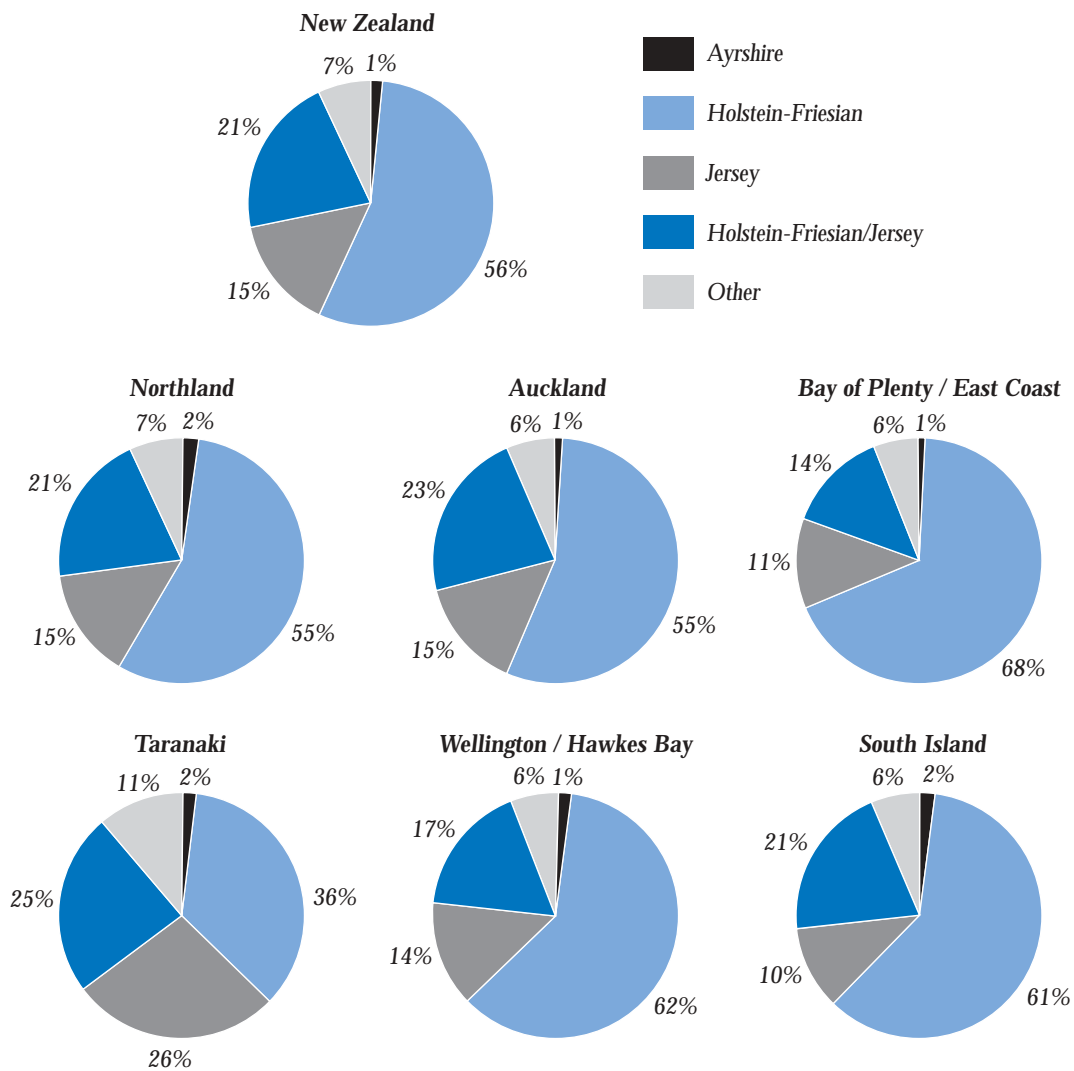
B. Breed breakdown

Three dairy breeds (Holstein-Friesian, Jersey and to a lesser extent Ayrshire) dominate the dairy cow inseminations carried out in New Zealand, as recorded on the Livestock Improvement 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. Cross-breed is emerging as a breed in its own right in 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 cross-bred and Ayrshire cows with the remaining breeds grouped into Other. Holstein-Friesian is the prevalent breed in every region excluding Taranaki. Bay of Plenty/East Coast region continues to have the highest percentage of Holstein-Friesian cows (68%), whereas Taranaki has the highest proportion of Jerseys (26%) and Holstein-Friesian/Jersey cross-breeds (25%).

Graph 5.3 Breed percentages of cows in each region in 2000/01

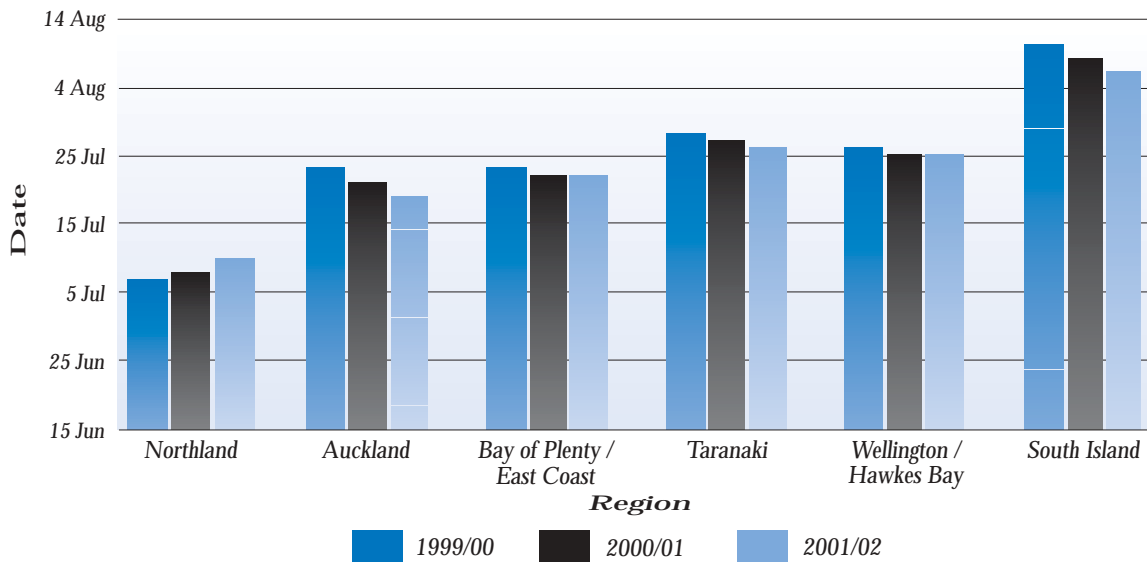


C. Planned start of calving and median calving dates

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 mating is started in the herd. The farmer has control over, and the ability to change, the start of mating.

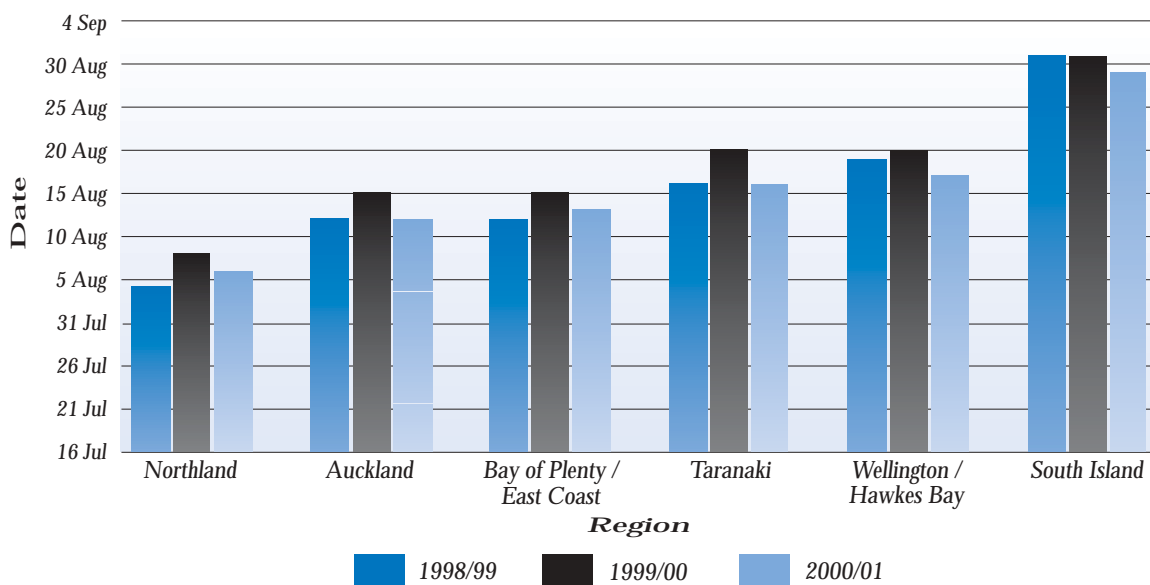
Mating and calving information is recorded on the Livestock Improvement National Database for approximately 85% of all herds. Only herds that have matings or calvings recorded for at least 50% of their recorded animals are included in this analysis. The forecast planned start of calving dates for mature cows for the 2001/02 season compared to the dates previously forecast for 1999/00 and 2000/01 seasons are shown in Graph 5.4.

Graph 5.4 Planned start of calving dates for mixed age cows by region



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 is used as an indicator of calving spread. Graph 5.5 compares median calving dates for mature cows for the three most recent seasons.

Graph 5.5 Median calving dates for mixed age cows by region



D. Operating structures

The main operating structures found on New Zealand dairy farms are owner-operator, sharemilker and 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 then have to pay wages. Owner-operators comprise the largest group of all operating structures.

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 2000/01, 113 (0.8%) of New Zealand dairy farms operated under a contract milking agreement.



- The percentage of sharemilkers continues to increase steadily
- 65% of all sharemilkers are 50/50 sharemilkers, 22% have 20–29% agreements

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 5.3. In 2000/01, 5,187 (37%) New Zealand dairy farms operated under a sharemilking agreement. Sixty-five percent (3,372) of all sharemilkers have 50/50 agreements. On average, owner-operators tend to farm smaller herds on smaller properties, while lower order sharemilkers and contract milkers tend to farm larger herds on larger properties.

Table 5.3 2000/01 Herd analysis by operating structure

Operating structure	Number of herds	Average herd size	Average effective hectares	Average cows per effective hectare
Owner-operators	8,592	229	89	2.6
Contract milkers	113	306	113	2.8
Sharemilkers:				
Less than 20%	296	325	118	2.9
20–29%	1,132	277	104	2.7
30–39%	317	234	91	2.6
40–44%	70	280	100	2.9
50/50 (45–55%)	3,372	290	106	2.8
All sharemilkers	5,187	285	106	2.8
All farms	13,892	251	96	2.7

Farm production in each of the main operating structure groups is shown in Table 5.4. The table shows that on average, sharemilkers on less than 20% agreements and contract milkers have higher production per farm, followed by 50/50 sharemilkers. Owner-operators and 30–39% sharemilkers have the lowest average production.

Table 5.4 2000/01 Farm production analysis by operating structure

Operating structure	Average litres per farm	Average kg milkfat per farm	Average kg milksolids per farm	Average kg milkfat per effective hectare	Average kg milksolids per effective hectare	Average kg milkfat per cow	Average kg milksolids per cow
Owner-operators	852,830	41,139	72,075	460	803	177	309
Contract milkers	1,164,844	56,674	98,964	517	902	183	319
Sharemilkers:							
Less than 20%	1,262,794	60,900	106,719	527	922	186	325
20 – 29%	1,008,490	49,449	86,358	489	851	179	312
30 – 39%	826,350	40,621	70,906	452	788	172	300
40 – 44%	1,028,958	50,323	88,069	510	890	181	315
50/50 (45–55%)	1,072,563	52,119	91,290	494	864	178	312
All Sharemilkers	1,053,800	51,310	89,804	493	860	178	312
All farms	930,407	45,063	78,913	472	825	177	310



General statistics – Operating structures

Changes to the operating structure in the last eleven years are minimal. Table 5.5 shows the percentage of herds in each operating structure type from 1992/93 to 2000/01, whereas Table 5.6 gives the actual number of farms.

Table 5.5 Trend in the percentage of farms in each operating structure since 1992/93

Operating structure	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Owner-operators	56.7	57.2	65.7	65.0	63.6	63.1	62.7	62.7	61.8
Contract	–	0.7	0.6	0.8	1.3	1.2	1.1	0.9	0.8
Sharemilkers:									
29%	0.9	0.8	1.1	0.9	0.8	0.8	0.8	0.7	*
39%	0.9	0.7	0.9	0.9	0.7	0.6	0.5	0.5	*
50%	19.4	18.6	24.9	24.5	23.4	24.0	23.7	23.7	24.3
Other	4.0	4.0	6.8	7.8	9.3	10.2	11.2	11.5	13.1
All Sharemilkers	25.1	24.1	33.7	34.2	34.3	35.7	36.2	36.4	37.3
Unknown	18.2	18.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

– Not available

* Included in "Other"

From 1989/90 owner-operators includes leased farms

Table 5.6 Trend in the number of farms in each operating structure since 1992/93

Operating structure	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Owner-operators	8,201	8,344	9,627	9,581	9,368	9,263	9,005	8,694	8,592
Contract	–	97	84	121	195	172	154	126	113
Sharemilkers:									
29%	130	118	158	133	120	124	114	98	*
39%	126	108	138	138	108	95	76	66	*
50%	2,803	2,714	3,642	3,614	3,455	3,522	3,403	3,280	3,372
Other	572	583	994	1,149	1,367	1,497	1,610	1,597	1,815
All Sharemilkers	3,631	3,523	4,932	5,034	5,050	5,238	5,203	5,041	5,187
Unknown	2,626	2,633	6	0	128	0	0	0	0
Total	14,458	14,597	14,649	14,736	14,741	14,673	14,362	13,861	13,892

– Not available

* Included in "Other"

From 1989/90 owner-operators includes leased farms



6. Disease control

A. Enzootic Bovine Leucosis (EBL) eradication scheme

- 1.8% of herds have a positive EBL Status
- Confirmed positive herds declined from 344 to 250
- 9,491 herds (68%) achieve a “Free” herd status
- Scheme meets disease freedom requirements (<0.2% Incidence rate for Free herds)

The 2000/01 season is the fourth year of an eight year national programme to eradicate EBL (Enzootic Bovine Leucosis) from the New Zealand Dairy Industry. Testing and control during this period continued on a voluntary basis with all testing undertaken at the Livestock Improvement National Milk Analysis Centre and results and status reported using the Livestock Improvement National Database and MINDA reports. The EBL Eradication scheme is dairy industry funded.

The EBL Eradication Scheme continues to achieve good progress in reducing the number of infected herds (Table 6.1). The risk of negative herds reverting to a positive status is also extremely low. Herds with a Free status at the beginning of the 2000/01 season are meeting international requirements to demonstrate disease freedom (< 0.2 % cumulative annual incidence).

Herds are screened annually using individual herd test or custom collected milk samples and bulk milk samples provided by the dairy companies. Once herds achieve a Free status the individual milk sample testing is reduced to every second season. A total of 11,952 herd tests from 6,809 herds were processed for EBL. A further 1,069 visits to collect and test individual milks samples from herds not production testing were also completed. There were 1,156 visits to collect and test blood samples from infected herds.

The EBL Control Scheme is managed and operated by Livestock Improvement. Veterinarians are contracted to assist herd owners/managers of infected herds by providing technical advice and implementing management plans. In December 2000 the New Zealand Dairy Board recommended to dairy companies that EBL testing and control should become a condition of supply for all dairy farmers from the end of the 2000/01 season.

Table 6.1 Summary of Enzootic Bovine Leucosis (EBL) status for all dairy herds since 1997/98 season

Status	Herds 97/98	% 97/98	Herds 98/99	% 98/99	Herds 99/00	% 99/00	Herds 00/01	% 00/01
Blood Positive	891	6.1	674	4.7	344	2.5	250	1.8
Individual Milk Positive	68	0.5	67	0.5	28	0.2	41	0.3
Pool Milk Positive	108	0.7	19	0.1	4	0.0	2	0.0
Monitored Positive (vat test only)	91	0.6	30	0.2	30	0.2	6	0.0
Suspect (purchased from positive herd)	158	1.1	377	2.6	359	2.6	226	1.6
Free	–	–	1,298	9.0	5,596	40.4	9,491	68.3
Negative Year 2	1,331	9.1	5,221	36.4	4,086	29.5	1,763	12.7
Negative Year 1	5,718	39.0	5,100	35.5	1,650	11.9	1,282	9.2
Provisionally Negative	–	–	478	3.3	684	4.9	203	1.5
Monitored Negative (Vat test only)	5,438	37.1	1,033	7.2	497	3.6	351	2.5
Untested	870	5.9	65	0.5	583	4.2	277	2.0
Total	14,673		14,362		13,861		13,892	



B. Tuberculosis (TB) control

■ Number of infected dairy herds about the same as the previous season

Tuberculosis (TB) is a chronic infectious disease characterised by the formation of tubercles in the tissues of the body. Various tissues and organs including the lungs, lymphatic system, kidneys, liver, intestines and brain may become infected. The disease is caused by the organism *Mycobacterium spp.* of which there are three strains: *M. bovis* (cattle), *M. tuberculosis* (human) and *M. avian* (bird). Cattle can be susceptible to strains other than *M. bovis* and react to initial testing in the same way but the disease is not as serious with this infection.

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, ferrets).

In 2000/01 the number of infected dairy herds (106) is lower than previous seasons (131 in 1999/00, 135 in 1998/99).

Table 6.2 2000/01 Tuberculosis (TB) testing and results

Region	Vector Status	Number of infected dairy herds June 2001	Number of dairy cattle primary tested	Number of Tuberculous# dairy cattle
Northland	Free	0	94,504	0
Auckland	Free	0	40,684	0
	Risk	0	10,298	0
Waikato	Free	11	1,227,391	44
	Risk	9	161,664	21
Bay of Plenty	Free	7	103,714	23
Gisborne	Free	0	297	0
Hawkes Bay	Free	1	20,119	1
	Risk	0	4,663	0
Taranaki	Free	2	161,632	5
Manawatu / Wanganui	Free	4	135,912	10
	Risk	2	78,694	29
Wellington	Risk	11	123,691	16
Nelson / Marlborough	Free	3	67,478	3
	Risk	1	9,970	1
West Coast	Free	1	4,649	2
	Risk	37	160,796	129
Canterbury	Free	3	145,232	4
	Risk	3	92,235	60
Otago	Free	2	91,187	2
	Risk	4	77,489	6
Southland	Free	5	153,747	8
	Risk	0	30,118	0
North Island	Free	25	1,784,253	83
	Risk	22	379,010	66
North Island	Total	47	379,037	149
South Island	Free	14	462,293	19
	Risk	45	370,608	196
South Island	Total	59	832,901	215
New Zealand	Free	39	2,246,546	102
	Risk	67	749,618	262
New Zealand	Total	106	2,996,164	364

Sourced from Animal Health Board Annual Report for the year ending 30 June 2001

'Tuberculous Animals' include lesioned reactor cattle and lesioned cull cattle



Appendix 1: Farming regions and districts

The following map shows the six Livestock Improvement Corporation Limited regions and the farming regions used in all analyses presented in this report. The list of districts and cities within each region is also given.

1	Northland Far North Whangarei Kaipara	9	Taranaki New Plymouth Stratford South Taranaki	15	South Canterbury Timaru MacKenzie Waimate
2	Central Auckland Rodney North Shore Waitakere Auckland Manukau Papakura Franklin	10	Wellington Wanganui Rangitikei Manawatu Palmerston North Horowhenua Kapiti Porirua Upper Hutt Lower Hutt Wellington	16	Otago Waitaki Central Otago Queenstown/Lakes Dunedin Clutha
3	South Auckland Thames/Coromandel Hauraki Waikato Matamata/Piako Hamilton Waipa Otorohanga South Waikato	11	Wairarapa Tararua Masterton Carterton South Wairarapa	17	Southland Southland Gore Invercargill
4	Bay of Plenty Western Bay of Plenty Tauranga Whakatane Kawerau Opotiki	12	Nelson/Marlborough Tasman Nelson Marlborough Kaikoura		
5	Central Plateau Rotorua Taupo	13	West Coast Buller Grey Westland		
6	Western Uplands Waitomo Ruapehu	14	North Canterbury Hurunui Waimakariri Christchurch Banks Peninsula Selwyn Ashburton		
7	East Coast Gisborne Wairoa				
8	Hawkes Bay Hastings Napier Central Hawkes Bay				

