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 extension service, research to improve farm profitability, statistical information related to the New Zealand dairy industry and herd recording on the Livestock Improvement National Database.

1999/00 Dairy Statistics 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, 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

- ***Record production in 1999/00***
- ***14% increase in milksolids***

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 1999/00, seven co-operatively owned dairy companies processed 970 million kilograms of milksolids from seasonal supply units into products predominantly for export. Seven town milk dairy companies processed milk primarily for domestic liquid milk consumption.

At 970 million kilograms, total milksolids processed into export products in 1999/00 represented a 14% increase from the 850 million kilograms in 1998/99.

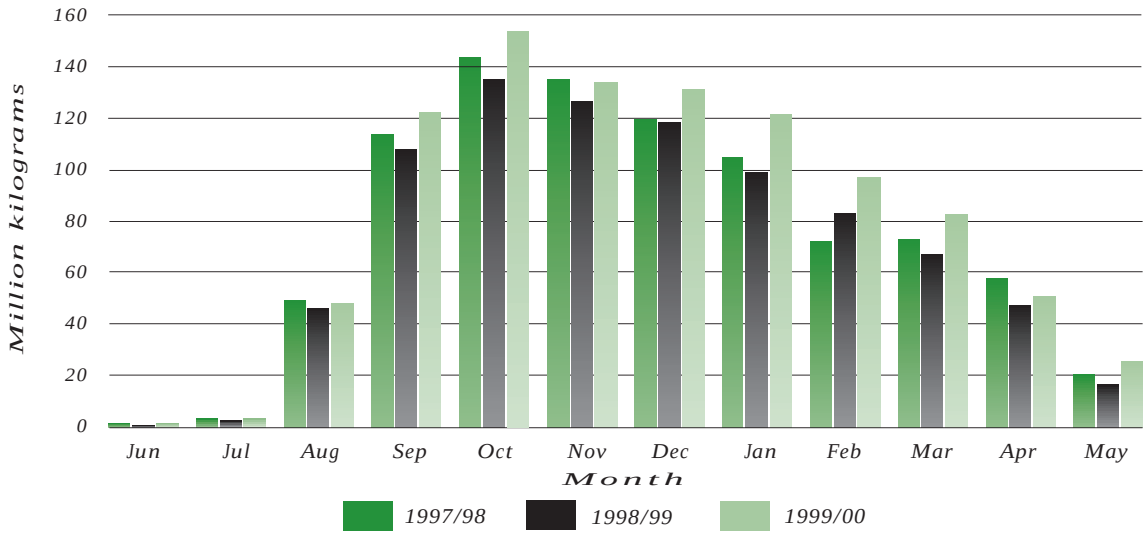
Table 2.1: **Summary of milk production statistics since 1974/75**

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

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

Comparing the 1999/00 season milksolids curve to the previous two seasons (Graph 2.1), the 1999/00 season production was higher than in the previous two seasons. Consistent with previous seasons, production peaked in October and consistently maintained a higher level than in the previous season, resulting in record production.

Graph 2.1: Seasonal trend in total milksolids processed



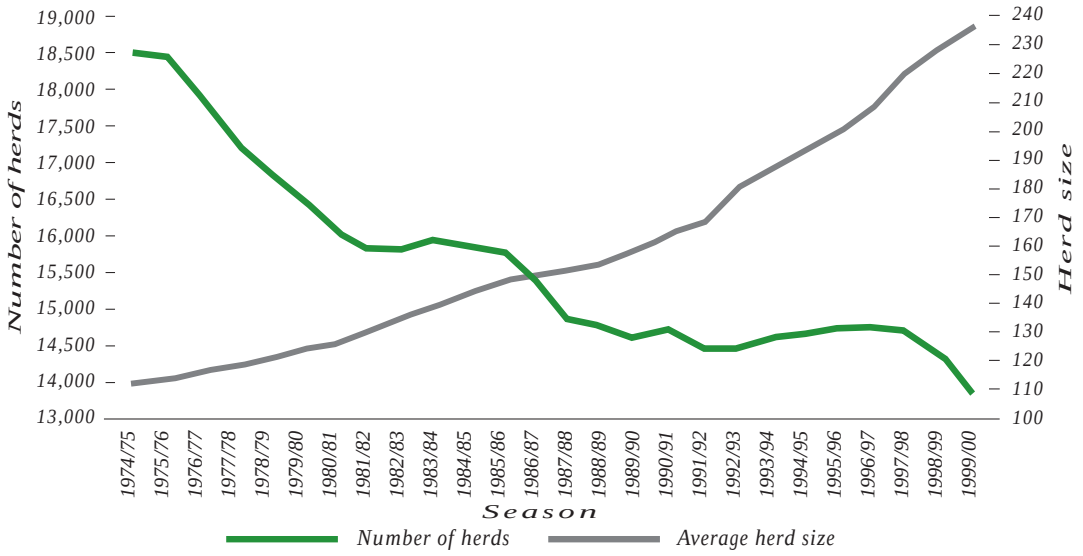
ii) Population

- ***Decrease in herd numbers***
- ***Increase in average herd size***
- ***Slight decrease in cow numbers***

Total herd numbers decreased in the 1999/00 season by 501 to 13,861, caused by amalgamations of farms as well as cessation of supply. The number of herds increased slightly between 1991/92 and 1997/98, however the historical decline resumed again after that. (Graph 2.2)

The average herd size increased to 236 in 1999/00, continuing the consistent upward trend since 1974/75. The average herd size is now double that recorded for the 1977/78 season.

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



The total cow population decreased 0.6% in the 1999/00 season to 3.269 million (Table 2.2), from 3.289 million cows in 1998/99. Average effective hectares and average cows per hectare increased in 1999/00, consistent with the upward trend since 1981/82.

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

– Not available

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

B. Farm production statistics

- ***Production per farm and per hectare increases***
- ***Milkfat and protein production per cow return to 1997/98 levels***

Farm production has typically increased since 1992/93 (Table 2.3). An exception was evident in 1998/99 where production dropped markedly. Average milkfat and protein per farm increased in 1999/00, consistent with increasing farm size. Average milkfat and protein per effective hectare increased to record levels. Production per cow increased in 1999/00 to an average of 165kg milkfat and 123kg of protein – similar to 1997/98 figures.

Table 2.3: **Summary of farm production since 1974/75**

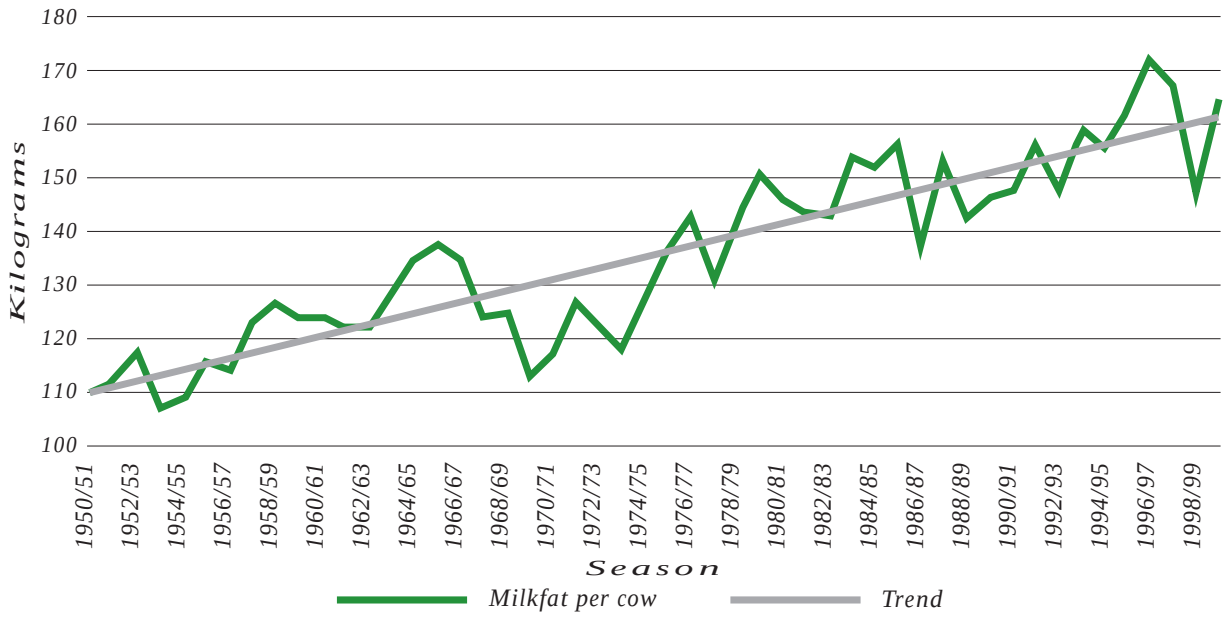
Season	*Average litres per farm*	*Average kg milkfat per farm*	*Average kg protein per farm*	*Average kg milkfat per effective hectare*	*Average kg protein per effective hectare*	*Average kg milkfat per cow*	*Average kg protein per cow*
1974/75	–	14,400	–	–	–	128	–
1975/76	–	15,700	–	–	–	137	–
1976/77	–	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	374	279	148	111
1993/94**	618,139	30,220	22,458	407	301	160	119
1994/95**	614,203	29,886	22,117	386	285	156	115
1995/96**	663,248	32,050	23,827	405	300	163	120
1996/97**	728,874	35,436	26,387	425	316	173	128
1997/98**	752,399	36,383	26,984	430	318	168	124
1998/99**	735,544	35,047	26,254	392	292	147	109
1999/00**	839,066	40,365	30,396	439	329	165	123

– not available
* *1991/92 figures include some town milk herds*
** *1992/93 to 1999/00 figures include all town milk herds*

i) Production per cow

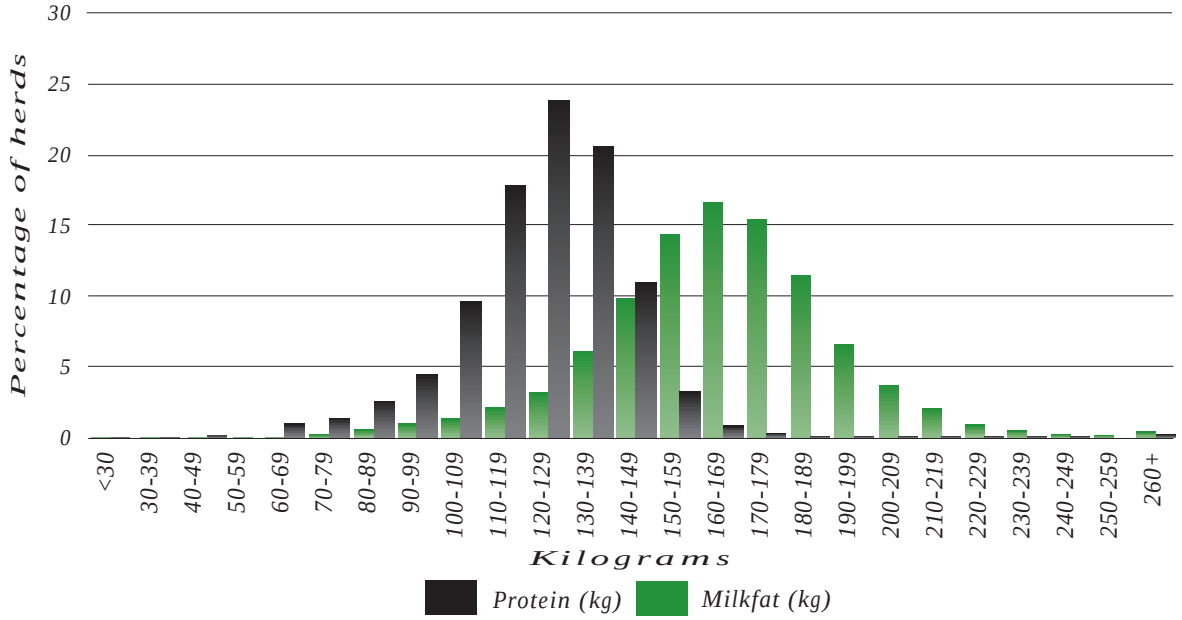
The trend of increased production per cow over the last 49 years (Graph 2.3) is due to genetic gain and improvements in farm management. These improvements from season to season are masked by the considerable effect of the weather on each season's actual production. For example, unfavourable weather conditions in 1986/87 caused production per cow to fall to its lowest level since 1977/78. It also influenced the decrease in production per cow for the 1998/99 season.

Graph 2.3: Trend in milkfat production per cow since 1950/51



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. The distribution of herds by milkfat and protein production per cow is shown in Graph 2.4.

Graph 2.4: Distribution of herds by milkfat and protein production per cow in 1999/00



ii) Herd size distribution

- ***20.1% of herds have 300 or more cows***
- ***46.3% of all herds have between 150 and 249 cows***

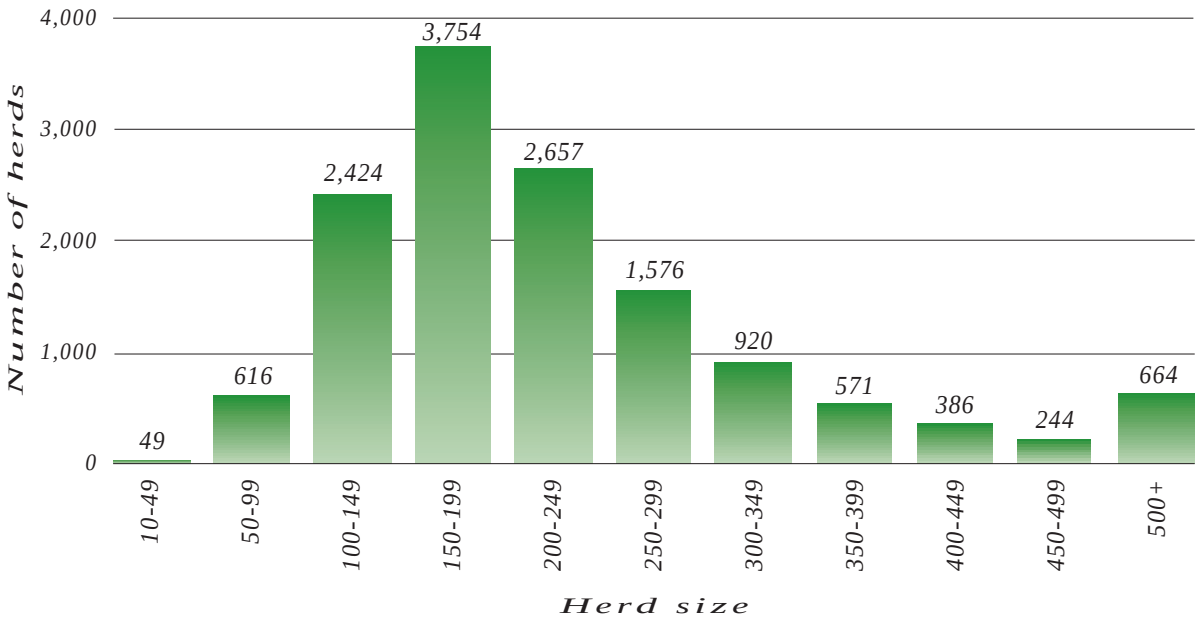
The average dairy herd size in 1999/00 was 236 cows. The number of herds with 300 or more cows has been increasing since 1970/71, except for a minimal decrease in 1998/99 (Table 2.4). In 1999/00, 2,785 herds had 300 or more cows or 20.1% of all herds.

Table 2.4: **Herds with 300 or more cows**

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

The herd size distribution presented in Graph 2.5 shows that the most common herd sizes are between 150 and 199 cows.

Graph 2.5: **Herd size distribution in 1999/00**



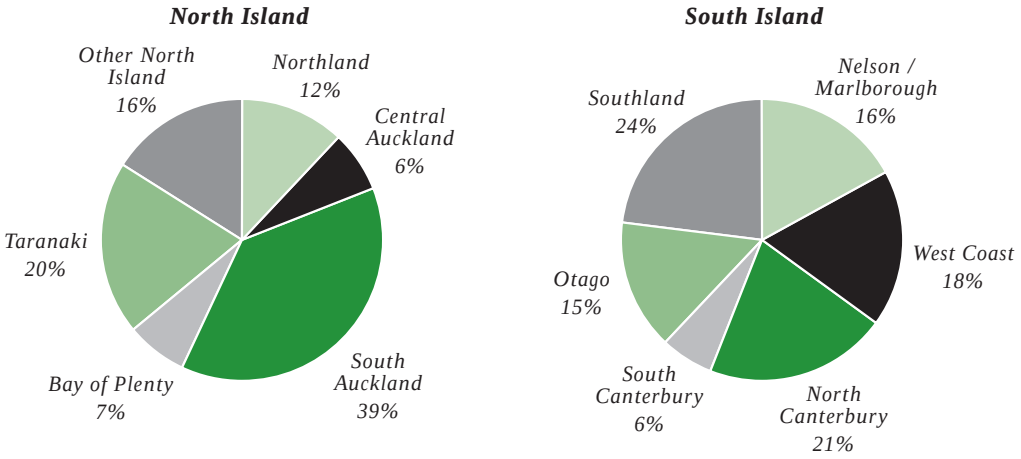
3. Regional dairy statistics

- ***Little change in the distribution of dairy farms from 1998/99 to 1999/00***

During the 1999/00 season, seven of the 14 dairy companies mainly supplied product for export (seasonal supply) and seven supplied the domestic market (town supply).

South Island farms account for 15% of the national total, compared with 14% last season. The distribution of dairy farms within regions of each island in 1999/00 (Graph 3.1) has remained similar to the previous season.

Graph 3.1: **Regional distribution of dairy farms in 1999/00**



- **0.6% decrease in cow numbers**
- **South Island cow numbers increase by 8.2%**
- **Average herd size in the South Island reaches 347**

Farms in the South Island are, on average, larger than those in the North Island, in terms of both physical size and cow numbers. Herd numbers in the North Island decreased 4.5% from 12,335 in 1998/99 to 11,775 in 1999/00 (Table 3.1). In contrast, the number of herds in the South Island increased 2.9% from 2,027 in 1998/99 to 2,086 in 1999/00. The average herd size in both islands continues to increase. Within the South Island, South Canterbury has the largest average herd size with 473 cows, up from the previous season's figure of 437 cows. In the North Island, Hawkes Bay has the largest average herd size with 359 cows.

Overall the number of dairy cows decreased by 0.6% from the 1998/99 season to the 1999/00 season, with the North Island cow population dropping by 2.9% (from 2,620,567 to 2,545,839) in contrast to the South Island cow population which rose by 8.2% (from 668,752 to 723,523).

Table 3.1: 1999/00 Herd analysis by region

Farming region	*Total herds*	*Total cows*	*Average herd size*	*Average effective hectares*	*Average cows per hectare*
Northland	1,455	286,689	197	99	2.1
Central Auckland	760	141,702	186	83	2.4
South Auckland	4,468	935,032	209	78	2.8
Bay of Plenty	782	183,706	235	88	2.8
Central Plateau	455	132,192	291	128	2.5
Western Uplands	80	20,705	259	123	2.4
East Coast	16	3,697	231	81	2.9
Hawkes Bay	67	24,062	359	142	2.6
Taranaki	2,391	482,371	202	75	2.8
Wellington	669	179,330	268	101	2.8
Wairarapa	632	156,353	247	95	2.7
North Island	11,775	2,545,839	216	86	2.7
Nelson/Marlborough	340	78,994	232	93	2.6
West Coast	366	84,300	230	121	2.0
North Canterbury	436	188,552	432	153	2.9
South Canterbury	120	56,744	473	171	3.0
Otago	304	118,069	388	142	2.9
Southland	520	196,864	379	146	2.7
South Island	2,086	723,523	347	135	2.7
New Zealand	13,861	3,269,362	236	93	2.7

- ***Highest 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 89,062 kilograms of milkfat and 69,052 kilograms of protein (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 66,012 kilograms of milkfat and 50,682 kilograms of protein.

In 1999/00 production per effective hectare and per cow shows that milkfat and protein per hectare and per cow is higher in the South Island than the North Island.

Table 3.2: 1999/00 Farm production analysis by region

Farming region	*Average litres per farm*	*Average milkfat per farm*	*Average protein per farm*	*Average milkfat per effective hectare*	*Average protein per effective hectare*	*Average milkfat per cow*	*Average protein per cow*
Northland	656,600	31,077	23,357	319	240	152	114
Central Auckland	615,758	28,664	21,778	350	266	149	113
South Auckland	719,409	34,590	25,894	450	336	161	120
Bay of Plenty	823,982	38,465	28,958	445	335	159	119
Central Plateau	1,050,980	49,627	36,989	409	304	167	124
Western Uplands	905,860	45,011	32,383	402	289	170	122
East Coast	760,887	36,611	27,506	491	367	169	126
Hawkes Bay	1,399,808	66,012	50,682	449	344	173	133
Taranaki	695,216	35,886	26,479	485	358	173	127
Wellington	979,179	45,686	35,019	456	349	165	126
Wairarapa	891,097	43,396	32,652	465	348	171	128
North Island	748,971	36,230	27,134	433	324	163	121
Nelson/Marlborough	829,015	39,842	29,516	437	322	167	123
West Coast	800,667	40,602	28,891	344	244	175	124
North Canterbury	1,733,324	81,139	63,012	523	408	178	139
South Canterbury	1,907,017	89,062	69,052	539	419	182	141
Otago	1,546,358	71,215	55,570	515	402	177	138
Southland	1,503,047	70,709	54,895	495	384	182	141
South Island	1,347,631	63,705	48,805	470	359	177	134
New Zealand	839,066	40,365	30,396	439	329	165	123

South Taranaki is the district with the most herds (1,378) and cows totalling 293,248 (Table 3.3). Waimate in South Canterbury has the highest average herd size with 615 cows and largest average hectares (236).

Table 3.3: 1999/00 Herd analysis by district

Region	District	Total herds	Total cows	Average herd size	Average effective hectares	Average cows per hectare
Northland	Far North	412	75,865	184	93	2.1
	Whangarei	457	96,897	212	106	2.1
	Kaipara	586	113,927	194	97	2.1
Central Auckland	Rodney	281	50,609	180	89	2.1
	Manukau City	32	6,520	204	75	2.7
	Papakura	17	2,989	176	74	2.5
	Franklin	430	81,584	190	80	2.5
South Auckland	Waikato	872	185,088	212	84	2.7
	Hamilton City	11	2,030	185	77	2.5
	Waipa	726	155,974	215	80	2.8
	Otorohanga	436	97,528	224	87	2.7
	Thames-Coromandel	116	24,967	215	88	2.6
	Hauraki	539	110,229	205	77	2.8
	Matamata-Piako	1,361	267,738	197	69	3.0
	South Waikato	407	91,478	225	86	2.7
Bay of Plenty	Western Bay of Plenty	284	67,856	239	88	2.8
	Tauranga	11	2,715	247	90	2.6
	Kawerau/Whakatane	380	90,123	237	89	2.8
	Opotiki	107	23,012	215	83	2.7
Central Plateau	Taupo	106	36,299	342	170	2.2
	Rotorua	349	95,893	275	115	2.5
Western Uplands	Waitomo	64	16,681	261	124	2.4
	Ruapehu	16	4,024	252	117	2.3
East Coast	Gisborne	6	1,189	198	67	2.9
	Wairoa	10	2,508	251	90	2.9
Hawkes Bay	Napier/Hastings	23	7,999	348	143	2.5
	Central Hawkes Bay	44	16,063	365	141	2.6
Taranaki	New Plymouth	624	117,673	189	75	2.6
	Stratford	389	71,450	184	70	2.7
	South Taranaki	1,378	293,248	213	76	2.9
Wellington	Wanganui	29	7,756	267	116	2.5
	Rangitikei	94	27,046	288	111	2.7
	Manawatu	303	79,303	262	97	2.8
	Palmerston North City	43	13,757	320	113	2.9
	Horowhenua	159	42,347	266	102	2.8
	Kapiti Coast	32	7,602	238	87	2.9
	Upper Hutt City	9	1,519	169	76	2.2
Wairarapa	Tararua	413	94,796	230	87	2.7
	Masterton	22	7,214	328	124	2.8
	Carterton	89	22,757	256	94	2.9
	South Wairarapa	108	31,586	293	118	2.6
North Island		11,775	2,545,839	216	86	2.7
Nelson/Marlborough	Marlborough	87	19,146	220	85	2.8
	Kaikoura	29	9,366	323	125	2.6
	Nelson City	7	1,320	189	62	3.1
	Tasman	217	49,162	227	93	2.6
West Coast	Buller	124	28,946	233	107	2.3
	Grey	62	16,780	271	144	1.9

Table 3.3 continued

Region	District	Total herds	Total cows	Average herd size	Average effective hectares	Average cows per hectare
	Westland	180	38,574	214	122	1.8
North Canterbury	Hurunui	47	26,526	564	219	2.9
	Waimakariri	74	20,082	271	107	2.8
	Christchurch City	11	2,927	266	81	3.3
	Banks Peninsula	16	2,358	147	78	2.0
	Selwyn	147	59,903	408	137	3.0
	Ashburton	141	76,756	544	186	3.0
South Canterbury	Timaru/MacKenzie	76	29,681	391	134	3.1
	Waimate	44	27,063	615	236	2.8
Otago	Waitaki/Central Otago	79	40,476	512	180	3.0
	Dunedin City	89	24,924	280	101	3.0
	Clutha	136	52,669	387	147	2.8
Southland	Gore	67	27,890	416	151	2.9
	Invercargill	52	17,968	346	136	2.6
	Southland	401	151,006	377	147	2.7
South Island		2086	723,523	347	135	2.7
New Zealand		13,861	3,269,362	236	93	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, with 44 farms, has the highest average production per farm with 119,034 kilograms of milkfat per farm and 91,459 kilograms of protein per farm (Table 3.4). The North Island district with the highest production is Central Hawkes Bay with an average of 66,431 kilograms of milkfat per farm and 50,919 kilograms of protein per farm.

Table 3.4: 1999/00 Farm production analysis by district

Region	District	Average litres per farm	Average kg milkfat per farm	Average kg protein per farm	Average kg milkfat per effective ha	Average kg protein per effective ha	Average kg milkfat per cow	Average kg protein per cow
Northland	Far North	589,905	27,556	20,787	295	222	143	108
	Whangarei	725,034	34,949	26,068	335	249	159	118
	Kaipara	650,123	30,533	23,048	323	244	152	115
Central Auckland	Rodney	582,886	28,255	20,935	320	236	150	111
	Manukau City	719,828	31,652	24,722	413	322	152	118
	Papakura	576,619	25,687	19,956	357	275	142	110
	Franklin	631,043	28,827	22,182	366	281	148	113
South Auckland	Waikato	729,470	34,252	25,994	419	317	157	119
	Hamilton City	608,619	30,845	22,487	393	284	150	108
	Waipa	744,571	35,611	26,738	449	336	161	120
	Otorohanga	779,226	37,532	28,004	436	325	163	121
	Thames-Coromandel	728,593	34,629	25,870	400	299	156	117
	Hauraki	700,764	33,577	25,126	440	329	160	120
	Matamata-Piako	665,978	32,719	24,286	482	357	162	120
	South Waikato	792,629	38,031	28,405	450	335	166	124
Bay of Plenty	Western Bay of Plenty	827,620	39,234	29,420	449	336	161	120
	Tauranga	895,393	41,870	31,671	435	328	162	122
	Kawerau/Whakatane	840,404	38,601	29,218	446	337	158	119
	Opotiki	748,664	35,591	26,533	435	323	159	118
Central Plateau	Taupo	1,246,873	58,990	43,997	364	271	166	124
	Rotorua	991,482	46,782	34,860	423	314	168	125
Western Uplands	Waitomo	904,644	43,644	32,452	390	290	163	121

Table 3.4 continued

Region	District	Average litres per farm	Average kg milkfat per farm	Average kg protein per farm	Average kg milkfat per effective ha	Average kg protein per effective ha	Average kg milkfat per cow	Average kg protein per cow
	Ruapehu	910,723	50,481	32,108	448	282	197	124
East Coast	Gisborne	716,437	34,658	25,975	522	387	188	138
	Wairoa	787,557	37,784	28,425	472	355	158	119
Hawkes Bay	Napier/Hastings	1,414,267	65,210	50,228	425	327	172	132
	Central Hawkes Bay	1,392,250	66,431	50,919	461	352	174	133
Taranaki	New Plymouth	637,662	32,533	23,899	437	321	167	122
	Stratford	618,459	31,218	23,244	445	331	165	122
	South Taranaki	742,947	38,722	28,560	518	382	178	131
Wellington	Wanganui	981,014	44,719	34,449	401	308	164	126
	Rangitikei	1,051,792	51,078	38,597	471	355	172	130
	Manawatu	958,636	44,962	34,398	462	353	166	126
	Palmerston North City	1,203,995	55,742	42,883	490	374	168	128
	Horowhenua	969,776	44,440	34,316	450	346	163	126
	Kapiti Coast	819,196	35,762	28,071	429	337	150	118
	Upper Hutt City	567,287	26,128	19,943	339	259	157	120
Wairarapa	Tararua	817,327	40,107	30,022	465	347	171	127
	Masterton	1,242,526	58,860	44,811	486	367	175	133
	Carterton	915,931	43,717	33,179	471	358	166	126
	South Wairarapa	1,081,148	52,560	39,800	453	341	178	134
North Island		748,971	36,230	27,134	433	324	163	121
Nelson/Marlborough	Marlborough	774,537	35,978	26,804	438	325	160	118
	Kaikoura	1,221,451	58,603	43,942	454	342	177	133
	Nelson City	657,671	28,429	22,285	453	355	148	116
	Tasman	803,938	39,252	28,909	433	318	168	124
West Coast	Buller	808,243	40,557	28,953	379	269	169	120
	Grey	962,906	47,819	34,323	339	242	177	126
	Westland	739,566	38,147	26,977	322	227	178	126
North Canterbury	Hurunui	2,275,457	107,387	82,730	535	413	188	145
	Waimakariri	1,025,621	45,786	36,039	447	352	161	127
	Christchurch City	983,622	45,182	34,917	515	405	153	120
	Banks Peninsula	451,595	20,464	15,622	264	201	135	103
	Selwyn	1,643,711	75,960	59,538	528	415	176	138
	Ashburton	2,221,390	106,033	81,788	585	451	193	149
South Canterbury	Timaru/MacKenzie	1,566,406	71,711	56,080	543	426	175	138
	Waimate	2,495,345	119,034	91,459	531	408	193	148
Otago	Waitaki/Central Otago	2,109,145	97,444	76,011	558	436	186	145
	Dunedin City	1,064,313	47,595	37,353	484	379	165	129
	Clutha	1,534,902	71,436	55,617	510	398	180	140
Southland	Gore	1,638,283	76,034	58,994	515	399	179	139
	Invercargill	1,392,979	64,991	50,902	446	347	174	135
	Southland	1,494,725	70,560	54,728	498	386	184	142
South Island		1,347,631	63,705	48,805	470	359	177	134
New Zealand		839,066	40,365	30,396	439	329	165	123

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 1999/00. 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 1999/00***

The regional uptake of herd testing services in 1999/00 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 region has the highest percentage of herds using herd testing with 87.9%. Auckland region at 94.1% reported the highest number of cows herd testing.

Table 4.1: **Use of herd testing by region in 1999/00**

All systems (Sample Officer, Self Sample and Self Sample Assist)

Livestock Improvement Region	*Herds tested*	*Total herds*	*% of total herds*	*Cows tested*	*Total cows*	*% of total cows*
Northland	1,283	1,736	73.9	274,713	337,298	81.4
Auckland	4,727	5,483	86.2	1,110,528	1,180,367	94.1
Bay of Plenty/East Coast	695	791	87.9	168,841	184,395	91.6
Taranaki	2,006	2,396	83.7	409,910	482,350	85.0
Wellington/Hawkes Bay	1,115	1,369	81.4	289,338	361,429	80.1
South Island	1,695	2,086	81.3	552,871	723,523	76.4
New Zealand	11,521	13,861	83.1	2,806,201	3,269,362	85.8

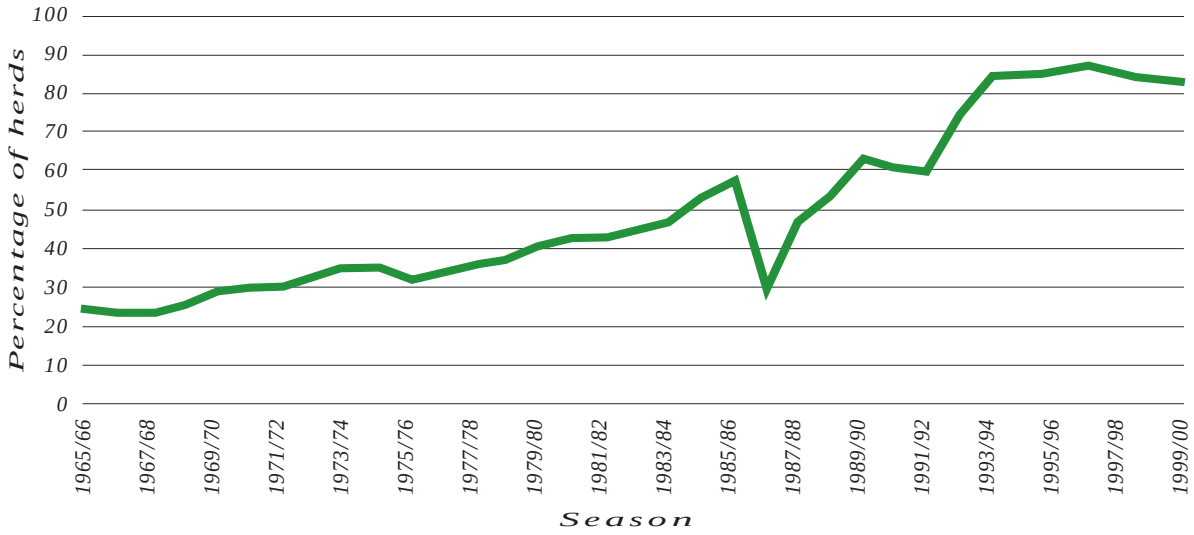
The percentage of total herds using herd testing decreased slightly to 83.1% in 1999/00 (Table 4.2). This figure is down 4.1% from the highest percentage of herd testing set in 1996/97. However, the percentage of total cows tested (85.8%) remained the same as the previous season.

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

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 milkfat 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 would likely 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 less than four tests reduces the average lactation length. Therefore, the reported number of days in milk for herd testing purposes 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.

i) Season averages

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

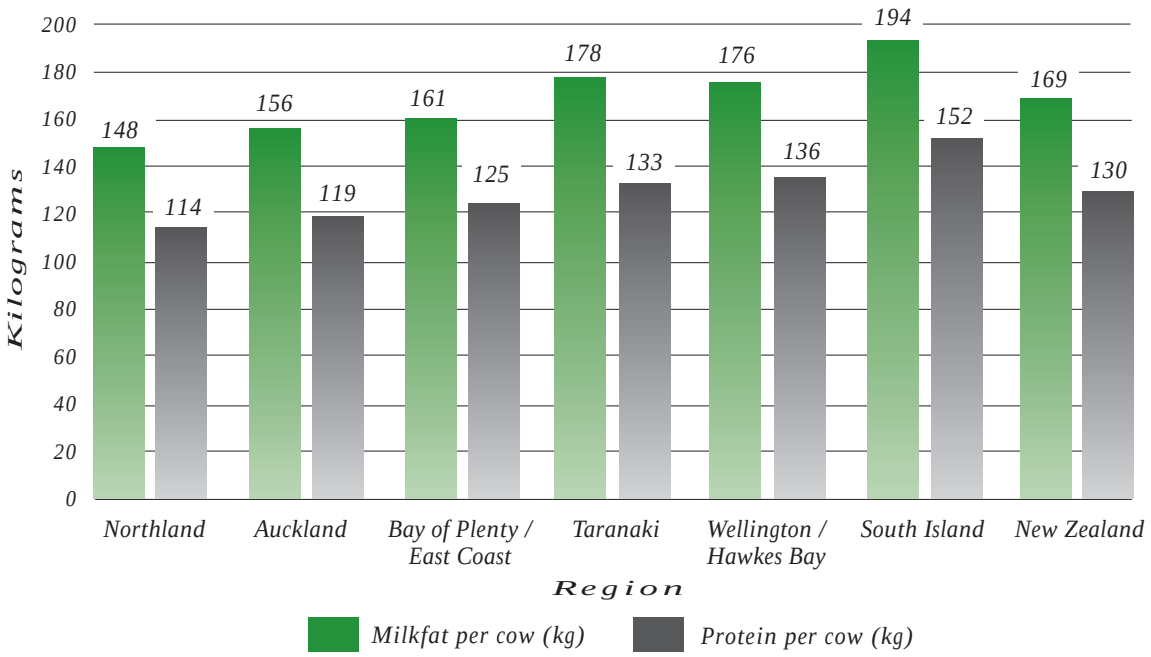
Average per cow statistics for each Livestock Improvement region is summarised in Table 4.3. The additional information for the days in milk (production) more accurately reflects the lactation length by using milk supply information from seasonal suppliers. The South Island recorded the highest per cow per day milk volume (4,246 litres), milkfat (194 kg) and protein (152 kg) of cows herd tested.

Table 4.3: 1999/00 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	3,232	148	4.56	114	3.49	208	219	276
Auckland	3,345	156	4.64	119	3.54	180	214	252
Bay of Plenty / East Coast	3,580	161	4.50	125	3.48	211	218	262
Taranaki	3,499	178	5.14	133	3.81	204	226	263
Wellington / Hawkes Bay	3,810	176	4.64	136	3.57	197	226	281
South Island	4,246	194	4.60	152	3.58	207	230	273
New Zealand	3,601	169	4.69	130	3.58	193	221	263

The 1999/00 milkfat and protein lactation regional averages of herd tested cows (Graph 4.2) shows a wide range in values between all regions, with milkfat production ranging from 148 (Northland) to 194 kg per cow (South Island) and protein production from 114 (Northland) to 152 kg per cow (South Island). Although the South Island region had the highest overall production, it also had the lowest proportion of cows herd tested.

Graph 4.2: Average milkfat and protein production per cow in 1999/00



• Increase in production per cow for 1999/00

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 more accurately reflects the 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

– not available

ii) Monthly averages

- ***Lowest Somatic Cell Count per cow per day recorded in Auckland***

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: 1999/00 Monthly herd test averages by region

Average litres of milk per cow per day

Livestock Improvement Region	1999 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2000 Jan	Feb	Mar	Apr	May	Season average
Northland	14.55	14.12	15.95	18.44	17.75	15.56	14.24	13.35	10.89	9.15	7.89	13.06	14.10
Auckland	16.56	16.69	18.48	20.50	20.33	16.73	15.88	14.45	12.29	8.46	6.99	11.33	15.08
B.O.P. / East Coast	16.12	14.77	19.32	21.01	20.77	17.74	16.39	15.15	12.46	10.24	9.47	11.03	15.81
Taranaki	15.97	17.47	17.78	19.53	19.91	16.63	15.45	15.19	13.71	10.09	8.46	10.27	14.94
Well. / Hawkes Bay	14.89	15.92	17.69	21.16	21.12	18.32	16.93	16.30	14.97	11.60	10.38	11.69	16.23
South Island	16.69	17.94	17.88	22.84	23.50	20.63	18.91	17.90	16.31	14.13	12.50	11.61	17.78
New Zealand	15.64	16.29	17.85	20.46	20.86	17.48	16.51	15.25	13.57	10.15	9.68	11.60	15.67

Average kg of milkfat per cow per day

Livestock Improvement Region	1999 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2000 Jan	Feb	Mar	Apr	May	Season average
Northland	0.63	0.64	0.73	0.82	0.78	0.70	0.65	0.63	0.53	0.47	0.41	0.60	0.65
Auckland	0.67	0.69	0.83	0.91	0.90	0.76	0.74	0.69	0.60	0.45	0.39	0.54	0.70
B.O.P. / East Coast	0.67	0.65	0.85	0.91	0.90	0.77	0.74	0.69	0.59	0.51	0.49	0.53	0.71
Taranaki	0.77	0.80	0.86	0.93	0.95	0.83	0.78	0.80	0.74	0.58	0.51	0.56	0.77
Well. / Hawkes Bay	0.63	0.68	0.78	0.93	0.93	0.82	0.78	0.77	0.73	0.60	0.55	0.59	0.76
South Island	0.74	0.79	0.78	0.99	1.03	0.91	0.85	0.82	0.77	0.71	0.65	0.60	0.82
New Zealand	0.67	0.71	0.80	0.91	0.93	0.80	0.77	0.73	0.67	0.53	0.52	0.59	0.74

Average kg of protein per cow per day

Livestock Improvement Region	1999 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2000 Jan	Feb	Mar	Apr	May	Season average
Northland	0.50	0.50	0.57	0.66	0.63	0.53	0.50	0.47	0.39	0.34	0.30	0.47	0.50
Auckland	0.55	0.56	0.68	0.75	0.73	0.58	0.56	0.51	0.43	0.32	0.28	0.42	0.54
B.O.P. / East Coast	0.55	0.51	0.70	0.75	0.73	0.60	0.56	0.52	0.43	0.37	0.36	0.42	0.55
Taranaki	0.60	0.61	0.67	0.74	0.75	0.61	0.57	0.58	0.53	0.41	0.35	0.42	0.57
Well. / Hawkes Bay	0.51	0.54	0.63	0.77	0.75	0.63	0.59	0.58	0.54	0.44	0.40	0.45	0.58
South Island	0.58	0.60	0.60	0.83	0.83	0.71	0.66	0.64	0.59	0.54	0.49	0.46	0.64
New Zealand	0.54	0.55	0.65	0.75	0.75	0.61	0.58	0.55	0.49	0.38	0.38	0.45	0.57

Average somatic cell count (000 cells per millilitre)

Livestock Improvement Region	1999 Jun	Jul	Aug	Sep	Oct	Nov	Dec	2000 Jan	Feb	Mar	Apr	May	Season average
Northland	205	211	177	177	175	170	192	202	229	259	344	269	208
Auckland	199	170	162	156	146	142	160	170	194	246	328	244	180
B.O.P. / East Coast	258	210	215	189	163	172	188	193	219	245	273	293	211
Taranaki	385	249	169	167	160	159	162	174	181	204	237	247	204
Well. / Hawkes Bay	221	183	217	179	175	169	181	183	203	216	239	249	197
South Island	231	234	240	202	176	180	187	200	200	213	215	236	207
New Zealand	218	209	181	169	160	158	172	181	198	233	266	246	193

iii) Breed averages

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

The 1999/00 herd test statistics were analysed for Holstein-Friesian, Jersey, Ayrshire and Holstein-Friesian/ Jersey cross-breds. 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. Six-year-old cows produced more milkfat, protein and milk than any other age group for Holstein-Friesian, Jersey and Holstein-Friesian/Jersey cross-bred cows. In the Ayrshire breed, six-year-old cows had the highest average milkfat production and eight-year-old cows had the highest average milk and protein production.

Table 4.6: 1999/00 Herd test breed averages by age of cow

Holstein-Friesian

Age	*Number*	*Days in milk*	*Milk (litres)*	*Milkfat (kg)*	*Protein (kg)*	*Milkfat %*	*Protein %*
2	241,172	219	3,131	136.7	107.8	4.39	3.45
3	223,829	214	3,632	157.4	125.1	4.37	3.45
4	204,584	215	3,945	173.9	137.4	4.44	3.49
5	179,903	215	4,111	179.4	141.9	4.40	3.46
6	141,323	215	4,214	182.1	144.6	4.35	3.44
7	110,226	214	4,161	180.8	144.0	4.38	3.48
8	83,957	213	4,059	177.1	140.6	4.39	3.48
9	56,296	210	3,924	171.6	135.6	4.40	3.47
10+	72,466	206	3,659	160.3	125.5	4.40	3.44
Total	1,313,756	215	3,803	165.8	131.3	4.39	3.46

Jersey

Age	*Number*	*Days in milk*	*Milk (litres)*	*Milkfat (kg)*	*Protein (kg)*	*Milkfat %*	*Protein %*
2	77,553	224	2,361	134.5	93.7	5.72	3.98
3	66,820	220	2,661	152.0	108.0	5.73	4.06
4	58,592	220	2,908	168.7	119.0	5.83	4.10
5	53,799	221	3,039	174.2	123.6	5.75	4.08
6	44,285	220	3,042	175.7	123.5	5.79	4.07
7	32,879	219	3,032	173.8	122.8	5.76	4.06
8	26,118	216	2,929	170.7	119.5	5.85	4.09
9	18,755	232	2,838	166.5	116.5	5.88	4.11
10+	24,327	210	2,719	155.1	109.7	5.72	4.05
Total	403,128	220	2,791	160.5	113.1	5.77	4.06

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

Age	*Number*	*Days in milk*	*Milk (litres)*	*Milkfat (kg)*	*Protein (kg)*	*Milkfat %*	*Protein %*
2	130,899	221	2,862	143.2	105.9	5.04	3.71
3	90,903	216	3,306	162.7	122.6	4.96	3.72
4	76,848	217	3,621	180.2	135.4	5.02	3.75
5	70,979	217	3,775	185.2	139.9	4.94	3.72
6	54,590	217	3,867	187.6	141.8	4.90	3.69
7	41,684	216	3,829	185.4	141.2	4.89	3.71
8	34,520	214	3,733	182.5	138.2	4.93	3.72
9	24,213	212	3,621	177.7	134.0	4.95	3.72
10+	31,343	207	3,402	164.4	123.7	4.86	3.65
Total	555,979	217	3,445	169.5	127.4	4.96	3.71

Ayrshire

Age	Number	Days in milk	Milk (litres)	Milkfat (kg)	Protein (kg)	Milkfat %	Protein %
2	5,183	222	2,839	125.9	100.1	4.45	3.53
3	4,772	218	3,220	142.2	114.8	4.43	3.57
4	4,215	218	3,599	157.8	128.2	4.40	3.56
5	3,813	218	3,729	161.2	132.1	4.35	3.55
6	3,241	217	3,756	162.8	132.9	4.35	3.54
7	2,548	216	3,744	161.7	132.3	4.33	3.54
8	1,943	216	3,770	162.4	133.2	4.32	3.54
9	1,344	214	3,649	158.3	129.0	4.36	3.54
10+	1,833	212	3,445	150.1	121.8	4.36	3.54
Total	28,892	218	3,452	150.7	122.3	4.39	3.55

Refinements made to the method used to compute the number of Holstein-Friesian/Jersey cross-breds have resulted in a more accurate reflection of total numbers. 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-breds and Ayshires have similar average liveweights.

Table 4.7: Liveweight by age and breed of cow for 1999/00

	Holstein-Friesian		Jersey		Holstein-Friesian/Jersey cross-bred		Ayrshire	
Age	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	406	16,907	318	6,168	376	10,018	368	273
3	457	4,025	363	1,280	425	2,779	433	102
4	489	3,266	391	1,025	457	2,129	444	50
5	504	2,583	396	1,105	466	1,793	462	42
6	518	1,868	410	839	479	1,364	472	45
7	525	1,561	406	616	487	1,007	483	24
8	525	1,127	410	437	485	708	484	37
9	516	714	406	282	484	464	506	9
10+	516	989	412	406	480	293	485	21
Total	450	33,040	355	12,158	420	20,855	417	603

C. Artificial Breeding (AB) statistics

- ***3.4% increase in total cows to AB for 1999/00***

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 seven seasons (Graph 4.3). A small increase in the number of yearlings to AB in 1999/00 contrasts with the general decline since 1995/96 (Table 4.8).

Table 4.8: Trends in Artificial Breeding (AB) use since 1991/92 by region: cows and yearlings to AB

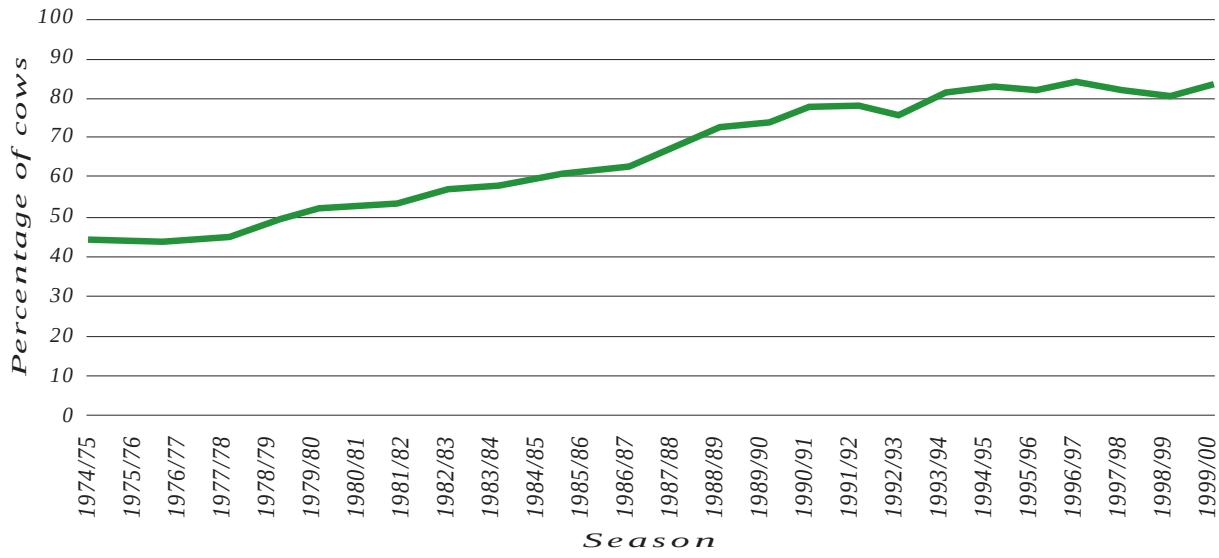
Cows to AB

Livestock Improvement Region	*1991/92*	*1992/93*	*1993/94*	*1994/95*	*1995/96*	*1996/97*	*1997/98*	*1998/99*	*1999/00*
Northland	224,597	216,772	249,293	253,662	257,557	262,429	258,057	244,115	246,617
Auckland	841,397	886,199	960,928	992,301	1,007,497	1,065,624	1,069,038	1,066,442	1,057,618
B.O.P./ East Coast	131,478	134,648	147,388	151,469	152,836	155,267	156,602	153,294	152,751
Taranaki	350,946	361,864	388,152	398,201	398,571	399,435	404,930	395,636	405,605
Well. / Hawkes Bay	164,950	174,192	204,054	220,471	230,582	254,002	266,514	266,171	276,517
South Island	181,003	206,475	266,201	319,949	371,210	437,078	483,968	510,514	587,957
New Zealand	1,894,371	1,980,150	2,216,016	2,336,053	2,418,253	2,573,835	2,639,109	2,636,172	2,727,065

Yearlings to AB

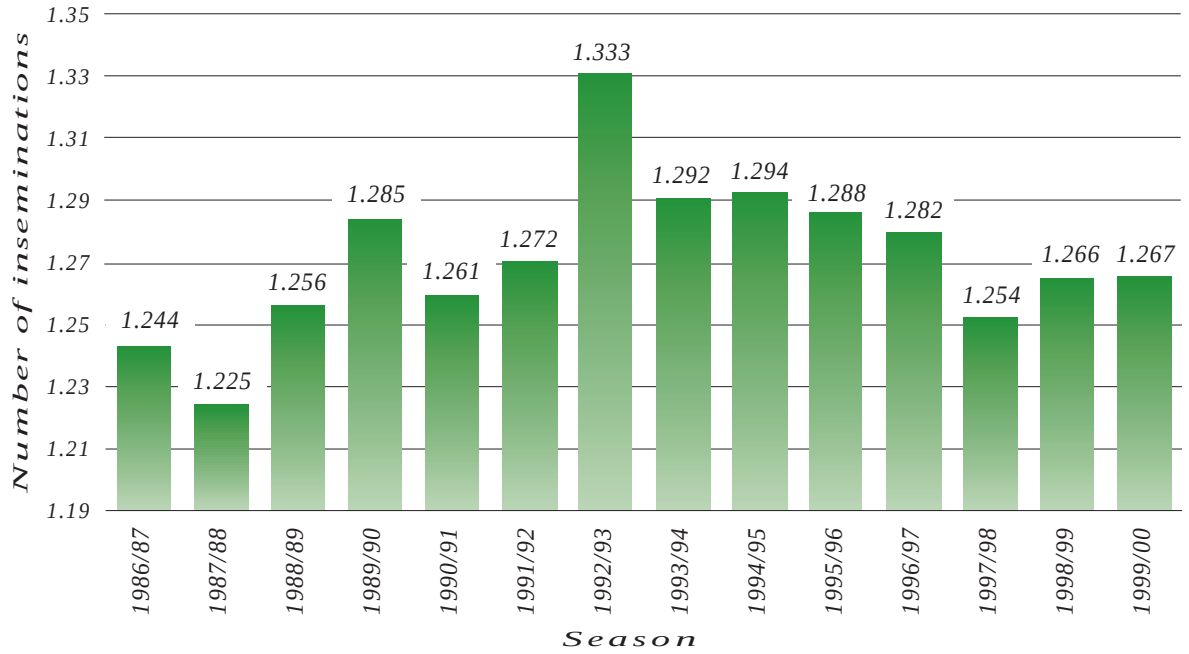
Livestock Improvement Region	*1991/92*	*1992/93*	*1993/94*	*1994/95*	*1995/96*	*1996/97*	*1997/98*	*1998/99*	*1999/00*
Northland	13,071	14,475	19,555	21,159	22,034	20,613	15,966	11,188	9,825
Auckland	24,921	32,608	42,856	54,867	53,038	48,291	31,102	25,968	21,804
B.O.P./ East Coast	6,996	8,582	13,286	16,773	17,501	15,753	10,317	7,854	7,250
Taranaki	9,884	11,989	15,740	19,099	17,864	11,909	8,428	5,748	5,700
Well. / Hawkes Bay	5,118	5,534	10,882	13,473	15,321	14,375	9,887	6,223	6,313
South Island	10,033	16,011	32,382	44,715	48,194	54,152	35,159	34,906	41,469
New Zealand	70,023	89,199	134,701	170,086	173,952	165,093	110,859	91,887	92,361

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



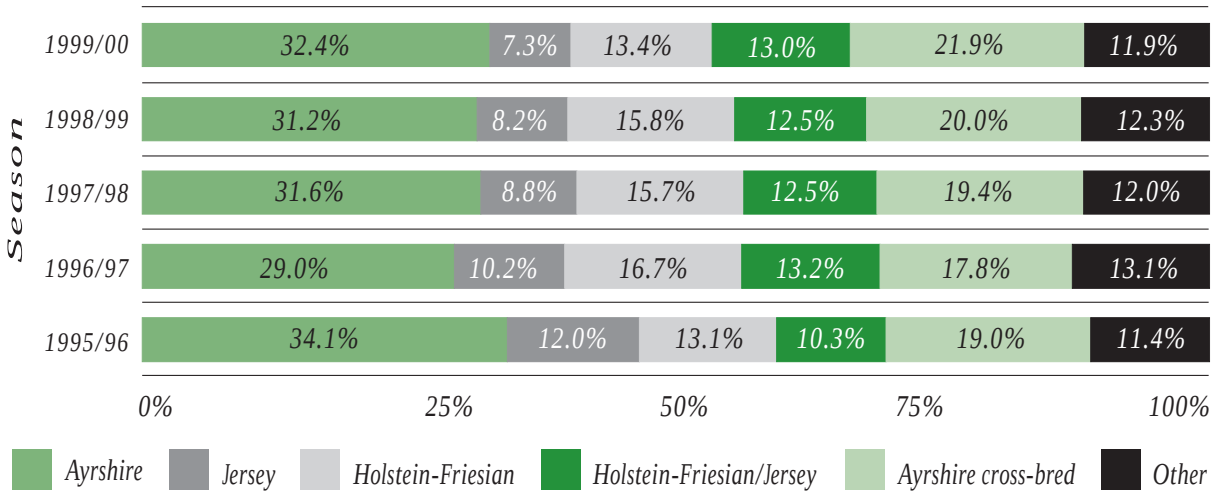
Since the 1986/87 season, the average number of inseminations per cow as recorded on the Livestock Improvement National Database has ranged between 1.23 (1987/88) and 1.33 (1992/93) inseminations (Graph 4.4). In 1999/00 the average number of inseminations per cow remained the same as the previous season at 1.27.

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

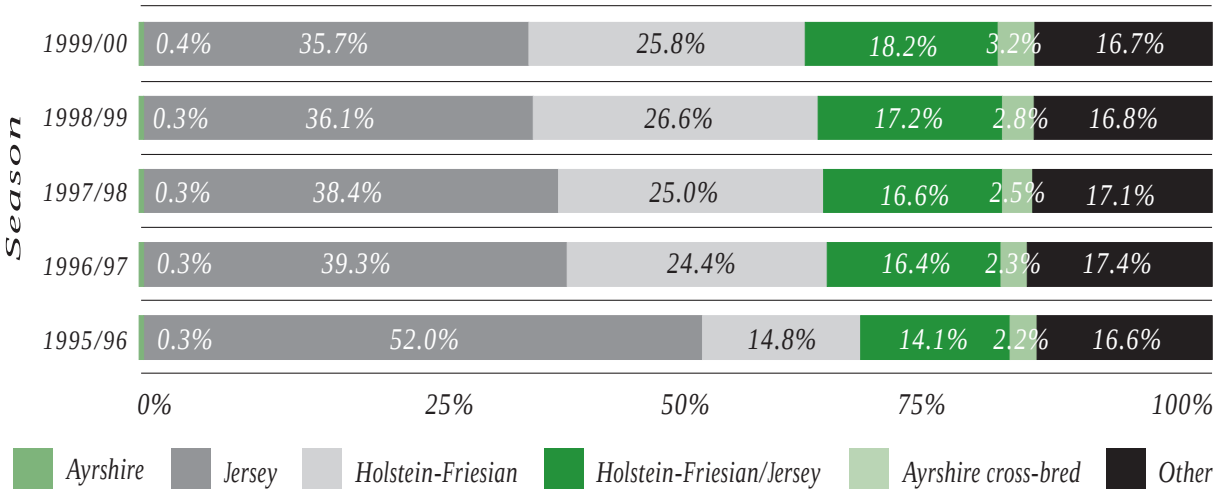


The use of Ayrshire, Holstein-Friesian and Jersey semen over different cow breeds for the five seasons from 1995/96 to 1999/00 is shown below. Ayrshire semen use over Jersey and Holstein-Friesian cows shows slight decreases compared to the previous season (Graph 4.5). The use of Jersey semen over other breeds remains similar to the previous season (Graph 4.6). The use of Holstein-Friesian semen over Holstein-Friesian cows has decreased, but increased slightly over all other breeds (Graph 4.7).

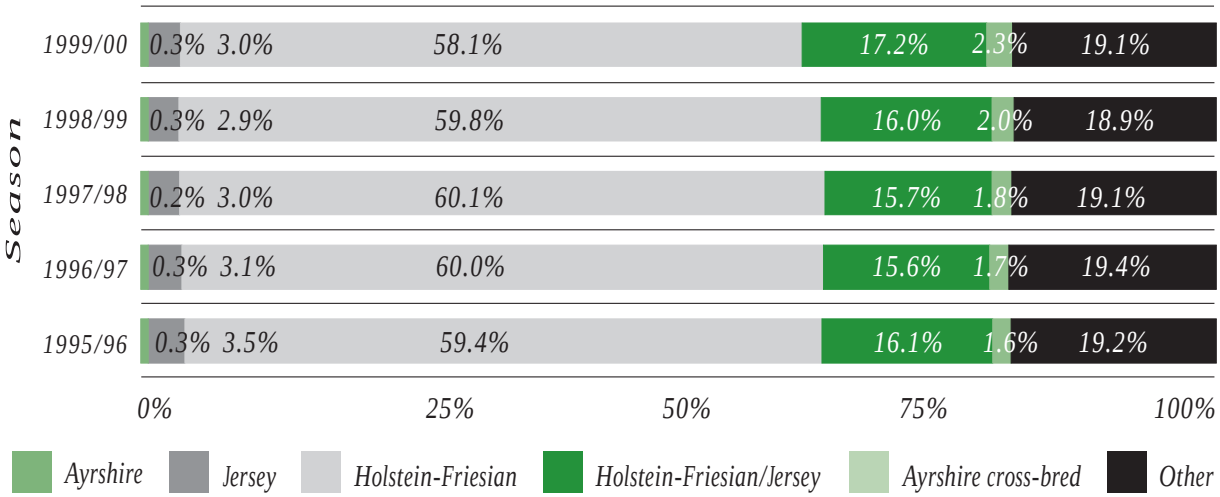
Graph 4.5: Ayrshire semen usage by cow breed since 1995/96



Graph 4.6: Jersey semen usage by cow breed since 1995/96

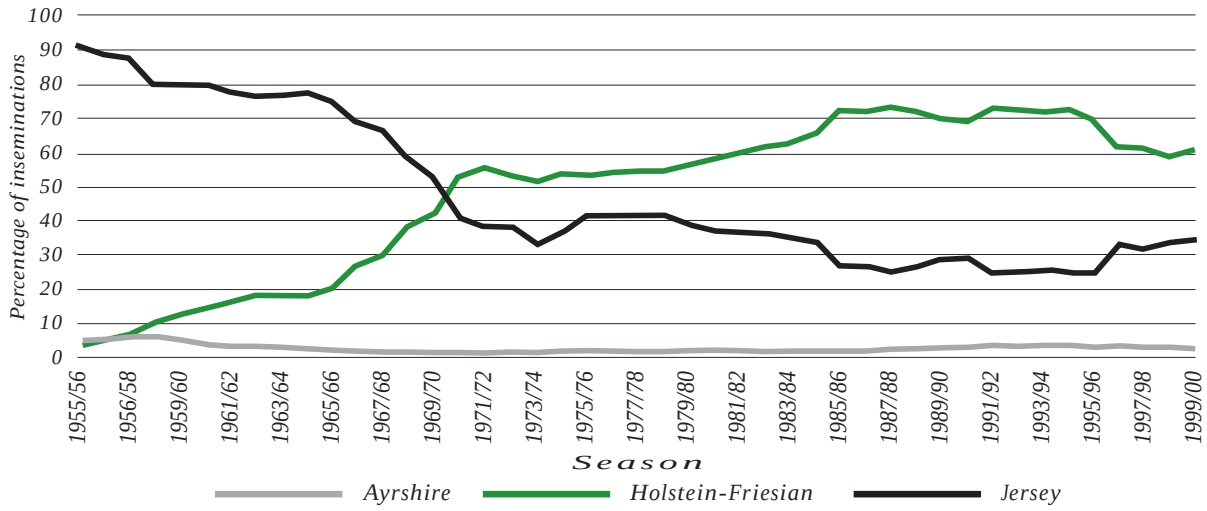


Graph 4.7: Holstein-Friesian semen usage by cow breed since 1995/96



The number 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 Holstein-Friesian and Jersey breeds increased slightly in use for the 1999/00 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 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:

Breeding Worth	=	Milkfat BV	x	$EV	+
		Protein BV	x	$EV	+
		Milk BV	x	$EV	+
		Liveweight BV	x	$EV	+
		Longevity BV	x	$EV	

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 1999/00 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 26 February 2000

	Milkfat ($/kg)	*Protein ($/kg)*	*Milk ($/kg)*	*Liveweight ($/kg)*	*Longevity ($/day)*
Breeding Worth	1.18	3.50	–0.049	–0.49	0.029
Production Worth	1.52	4.07	–0.059	–0.60	–
Lactation Worth	1.97	4.80	–0.069	–0.73	–

The information for all Animal Evaluation statistics was sourced from cows recorded on the Livestock Improvement National Database at 12 May 2000, and from sires recorded on the Livestock Improvement National Database at 10 June 2000.

Table 4.10 shows the Breeding Values (BV) and BW by breed, of all bulls born in 1995, first proven in the 1999/00 season with a Reliability of 75% or greater.

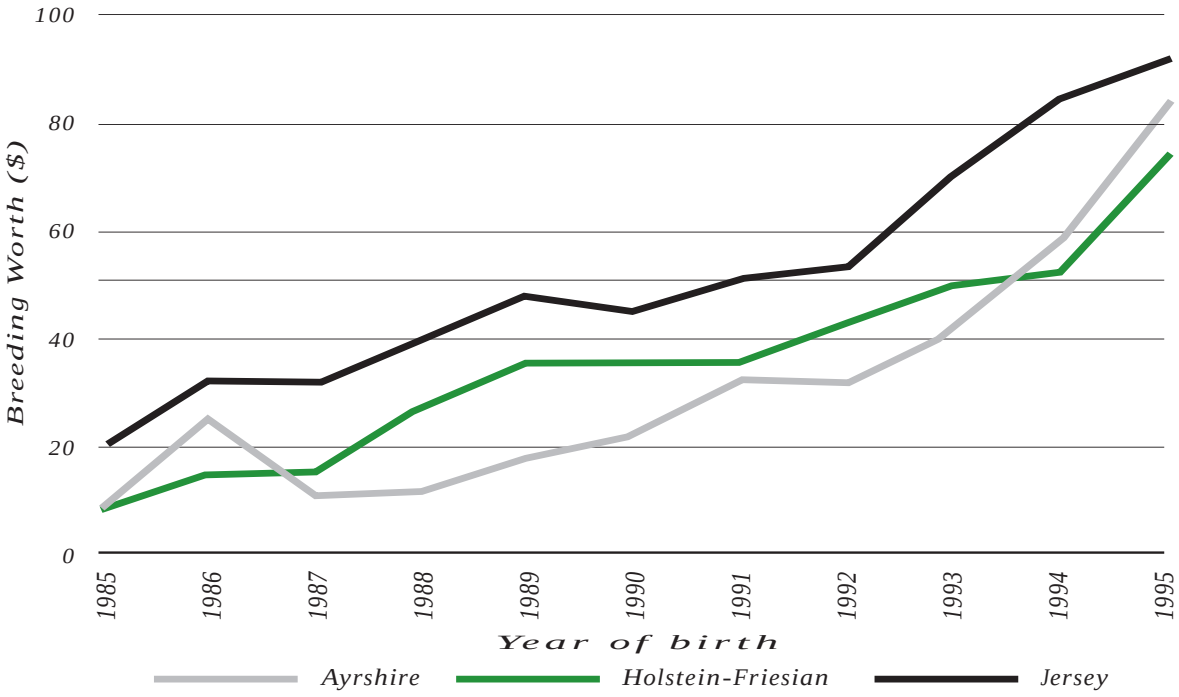
Table 4.10: Average Breeding Values (BV) and Breeding Worth (BW) of 1995 born bulls (reliability of 75% or greater)

Breed	*Milkfat BV*	*Protein BV*	*Milk Vol BV*	*Liveweight BV*	*Longevity BV*	*BW*	*Number of Sires*
Ayrshire	25.7	27.1	796	11.1	91.9	83.5	19
Holstein-Friesian	34.0	38.5	1272	78.7	–4.4	73.9	205
Jersey	21.7	14.0	137	–43.3	92.6	91.5	109

(Evaluation date 10 June 2000)

The genetic trend of proven dairy bulls is shown in Graph 4.9. Bulls born in 1995 are first proven in the 1999/00 season.

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



(Evaluation date: 10 June 2000)

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% – 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.

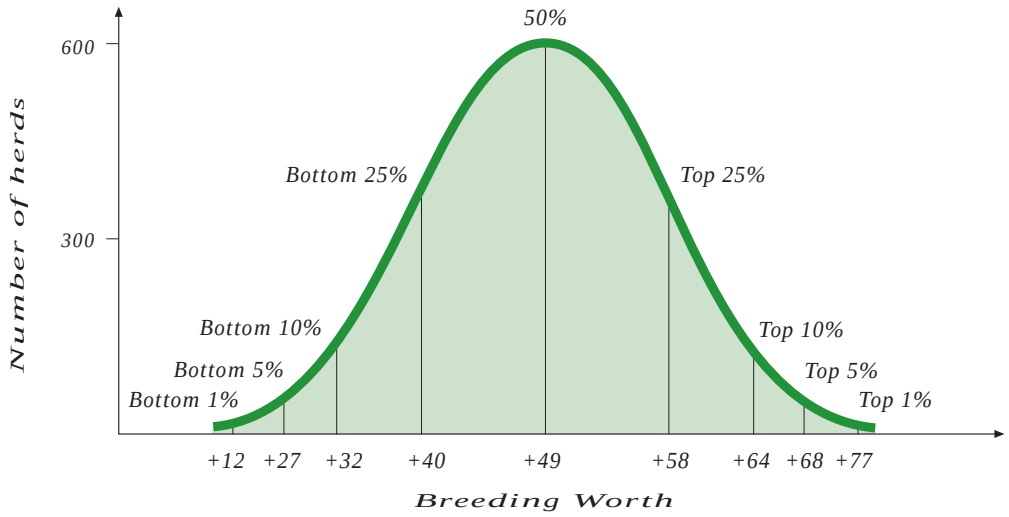
Table 4.11: Number of sires obtaining Breeding Worth (BW) by birth year and breed (reliability of 75% or greater, includes overseas bulls)

Year of birth	Number of sires	Holstein-Friesian	Jersey	Ayrshire	Other breeds
1985	313	184	93	22	14
1986	286	175	82	22	7
1987	318	193	94	18	13
1988	321	195	96	22	8
1989	364	212	116	20	16
1990	348	209	103	25	11
1991	358	228	97	25	8
1992	350	219	104	21	6
1993	330	198	105	23	4
1994	361	220	113	25	3
1995	336	205	109	19	3

(Evaluation date: 10 June 2000)

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 1999/00 season. For example Graph 4.10 shows that 50% of New Zealand herds have a BW of 49 or above and that 25% of New Zealand herds have a BW of 58 or above.

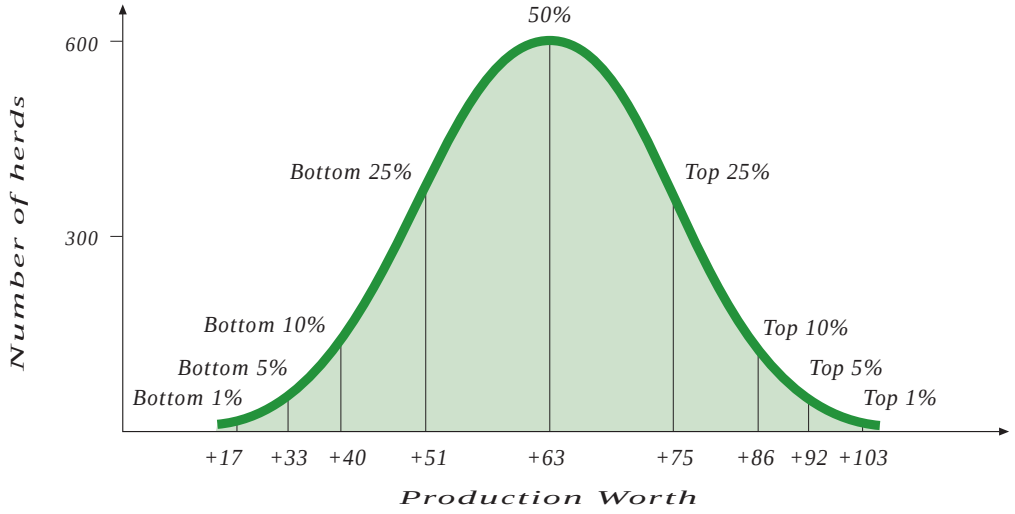
Graph 4.10: Distribution of herd Breeding Worth (BW) in 1999/00



(Evaluation date: 12 May 2000)

The distribution graph for PW for herds in the 1999/00 season is based on all cows recorded with a test number in herds signed up for herd testing for 1999/00. Graph 4.11 shows that 50% of New Zealand herds have a PW of 63 or above, and that 25% of New Zealand herds have a PW of 75 or above.

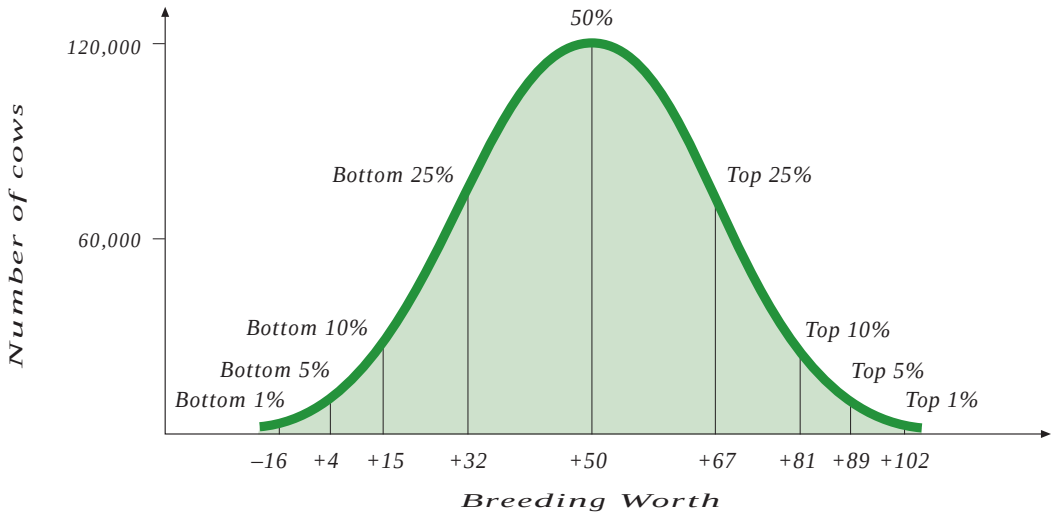
Graph 4.11: Distribution of herd Production Worth (PW) in 1999/00



(Evaluation date: 12 May 2000)

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 1999/00 season. Graph 4.12 shows that 50% of New Zealand cows have a BW of 50 or above and that 25% of New Zealand cows have a BW of 67 or above.

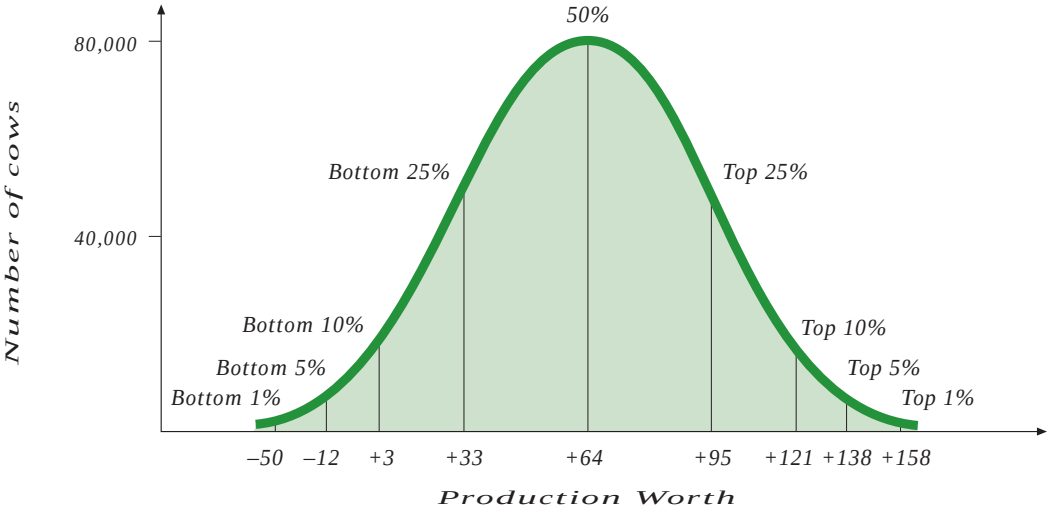
Graph 4.12: Distribution of cow Breeding Worth (BW) in 1999/00



(Evaluation date: 12 May 2000)

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 1999/00 season. Graph 4.13 shows that 50% of New Zealand cows have a PW of 64 or above and that 25% of New Zealand cows have a PW of 95 or above.

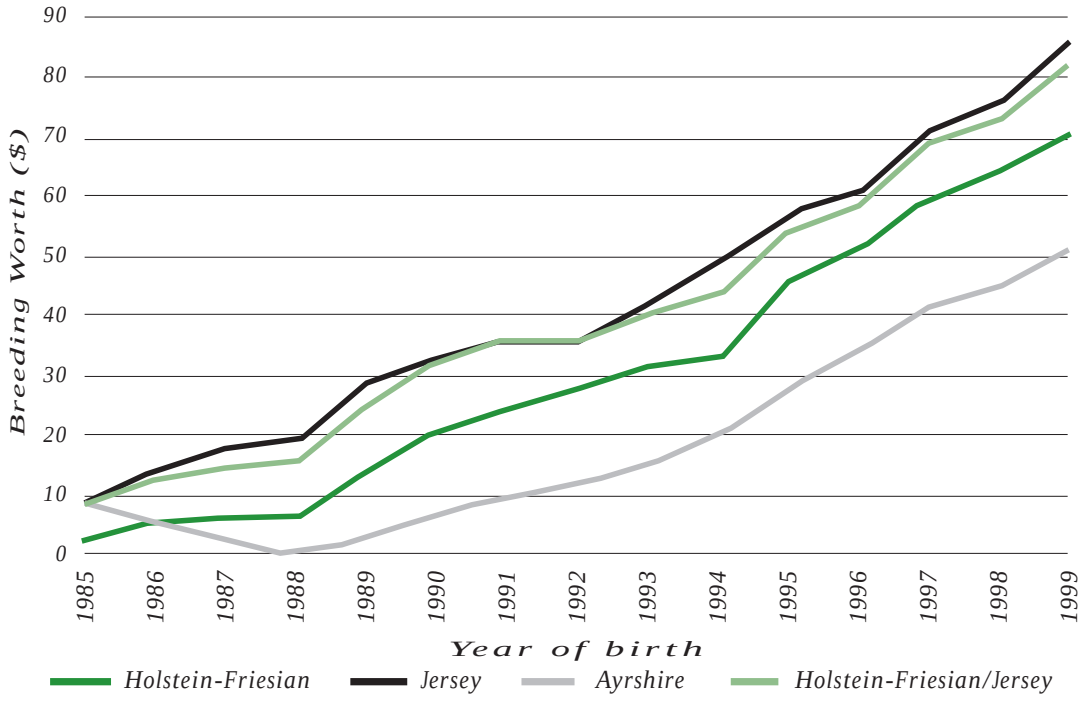
Graph 4.13: Distribution of cow Production Worth (PW) in 1999/00



(Evaluation date: 12 May 2000)

The genetic trend for cows is based on all cows recorded on the Livestock Improvement National Database in the 1999/00 season. Also included are the estimated BW and PW for replacement stock (1998 and 1999 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.

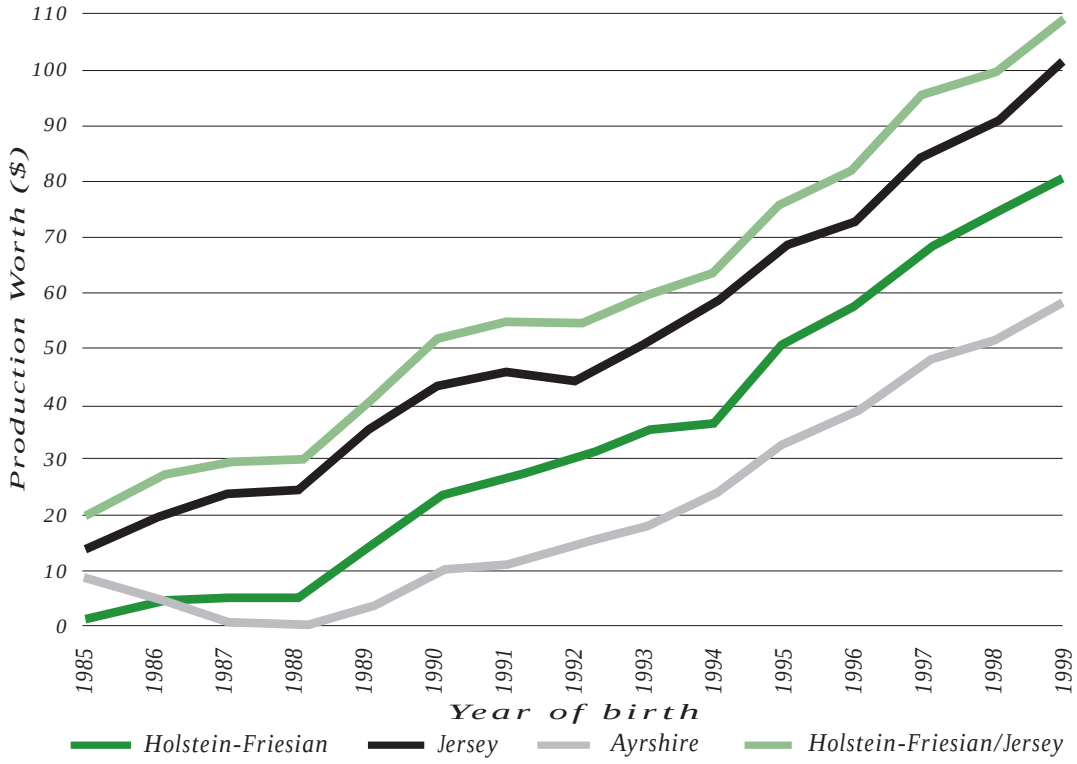
Graph 4.14: Genetic trend in Breeding Worth (BW) for all cows in 1999/00



(Evaluation date: 12 May 2000)

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

Graph 4.15: Trend in Production Worth (PW) for all cows in 1999/00



(Evaluation date: 12 May 2000)

Table 4.12 shows the average BVs and BW by breed, of all 1997 born cows. The Jersey breed has the highest BW at 70.8. 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 Values (BV) of all cows by breed born in 1997

Breed	BW $	Fat BV (kg)	Protein BV (kg)	Milk Vol BV (l)	Liveweight BV (kg)	Survival BV (%)	Cow numbers
Holstein-Friesian	59.1	26.95	26.51	833	54.6	73	425023
Jersey	70.8	16.96	6.67	–88	–43.7	64	125802
Ayrshire	41.3	11.08	15.51	488	6.9	46	10523
Holstein-Friesian/Jersey	68.9	23.49	17.15	375	5.7	85	195433
Guernsey	12.8	–2.21	1.52	29	18.2	–183	162
Milking Shorthorn	–5.1	–2.91	5.15	161	19.6	–77	1186
Brown Swiss	–24.4	–7.25	5.54	158	43.7	–215	171
Other	49.3	16.86	16.18	449	12.7	38	28215
Weighted Average	62.7	23.9	20.5	552	24.5	72.6	

(Evaluation date: 12 May 2000)

Survivability is measured by the percentage of cows that have a lactation recorded for consecutive years. The 1999/00 2-3 years figure is the percentage of cows that were milking as two-year-olds in the 1998/99 season and are now milking as three-year-olds in the 1999/00 season. Table 4.13 shows that for the 1999/00 season the highest percentage of survival is in animals ageing from 3-4 years.

Table 4.13: Survivability percentages since 1996/97

	Percentage (%) of age group surviving to next lactation						
Season	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

A refinement in the way survivability is calculated has resulted in minor adjustments to the percentages compared with previous seasons.

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 increases***

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)*	*Company payout (inflation adjusted)**
1973/74	–	0.76	6.22
1974/75	0.78	0.75	5.58
1975/76	0.81	0.83	5.37
1976/77	0.88	0.87	4.83
1977/78	0.96	0.98	4.75
1978/79	0.99	1.03	4.43
1979/80	1.20	1.22	4.69
1980/81	1.52	1.52	4.93
1981/82	1.91	1.95	5.50
1982/83	2.07	2.11	5.08
1983/84	2.01	2.09	4.66
1984/85	2.28	2.33	4.96
1985/86	2.30	2.29	4.17
1986/87	1.90	2.03	3.36
1987/88	2.07	2.34	3.25
1988/89	3.05	3.28	4.28
1989/90	3.33	3.59	4.49
1990/91	2.12	2.42	2.81
1991/92	2.98	3.34	3.78
1992/93	3.25	3.66	4.09
1993/94	2.90	3.32	3.67
1994/95	3.00	3.40	3.72
1995/96	3.60	3.99	4.17
1996/97	3.18	3.63	3.72
1997/98	3.00	3.42	3.46
1998/99	3.25	3.58	3.57
1999/00	3.35	3.78	3.78

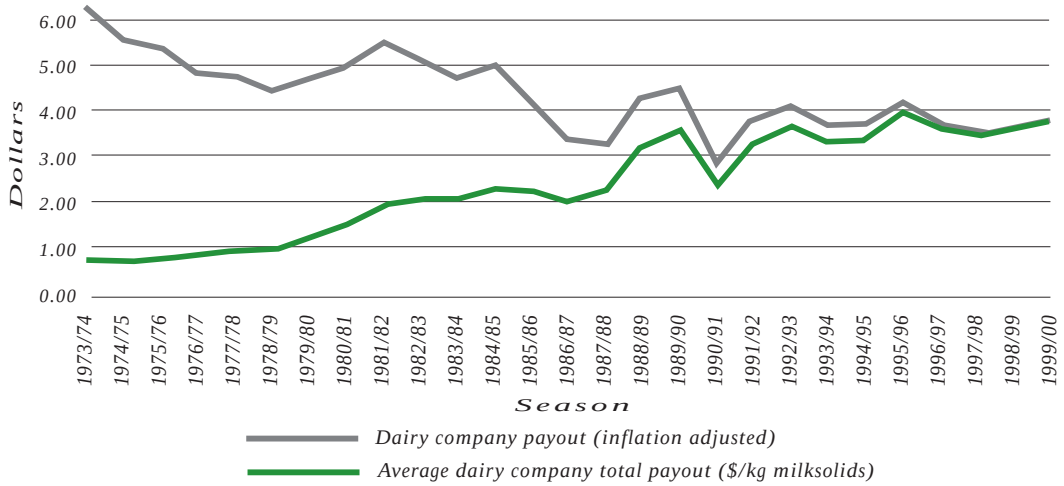
- Not available

** 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

- **6% 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

- **21% increase in farms sold compared with 1998**
- **600 farms sold in 1999**

From 1992 there has generally been a decrease in the numbers of dairy farms sold in the year, although in 1999 the number of farms sold increased 21% to 600 compared with 1998. Prior to 1992 the number of dairy farms sold annually fluctuated considerably. The average dairy farm price per kilogram of milksolids was $19.00 in 1999 (Table 5.2).

Table 5.2: Trend in dairy land sale values since 1978

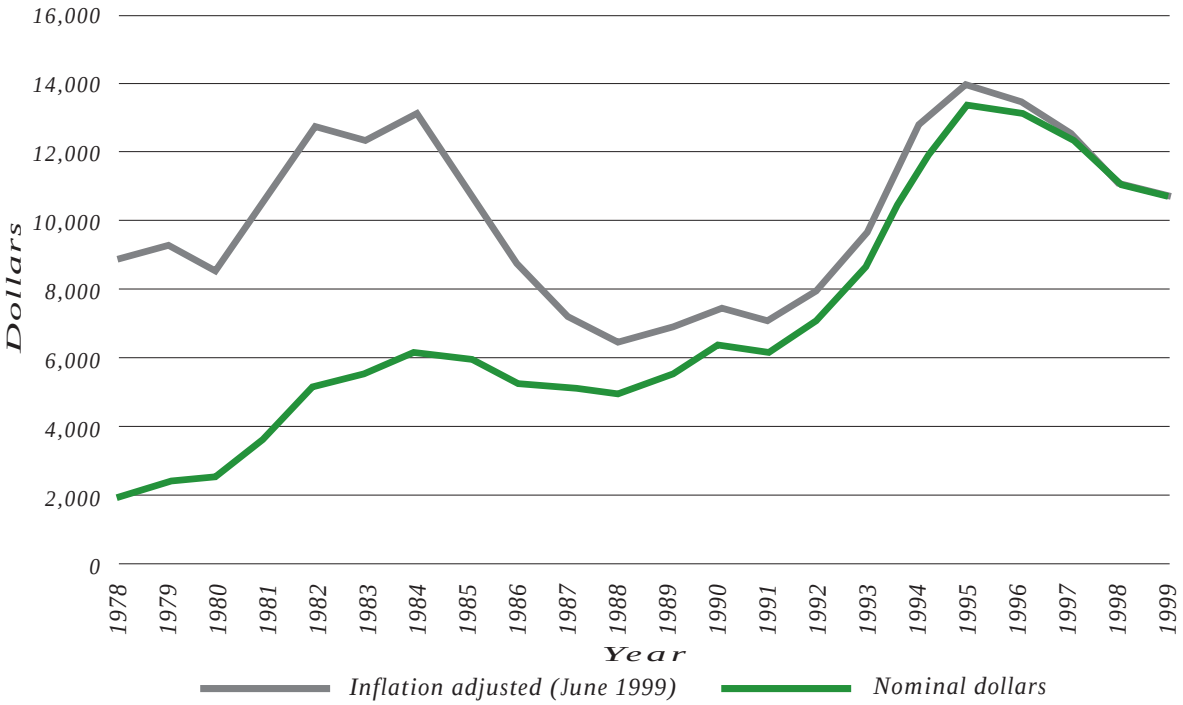
Year	Number of farms	Average sale price	Inflation adjusted average sale price **	Average hectares	Price per hectare	Inflation adjusted average price per hectare**	Price per kg milkfat	Price per kg milksolids*
1978	983	95,743	412,685	46	2,070	8,922	8.6	4.9
1979	1,245	122,661	469,966	50	2,436	9,333	9.7	5.6
1980	1,256	146,065	474,237	55	2,650	8,604	11.2	6.4
1981	1,327	208,246	588,266	55	3,783	10,686	14.8	8.5
1982	813	276,042	665,161	52	5,309	12,793	21.3	12.2
1983	527	257,373	573,214	46	5,587	12,443	20.4	11.7
1984	618	301,076	640,587	49	6,189	13,168	21.9	12.6
1985	505	298,746	545,157	49	6,044	11,029	21.0	12.1
1986	274	251,165	415,149	47	5,298	8,757	18.4	10.6
1987	504	270,180	375,250	52	5,212	7,239	16.8	9.7
1988	576	278,650	363,773	56	5,013	6,544	16.0	9.2
1989	1,013	325,847	407,309	59	5,561	6,951	17.8	10.2
1990	868	373,553	433,859	58	6,467	7,511	21.8	12.5
1991	538	362,819	409,965	58	6,283	7,099	21.7	12.5
1992	897	446,979	499,977	62	7,183	8,035	23.1	13.3
1993	834	543,984	601,087	61	8,903	9,838	31.0	17.8
1994	784	704,245	769,667	61	11,640	12,721	37.5	21.6
1995	672	775,110	809,937	58	13,400	14,002	41.9	24.1
1996	784	785,510	804,826	60	13,187	13,511	41.6#	23.9
1997	520	674,809	683,697	54	12,388	12,551	38.5#	22.1
1998	496	704,309	701,503	64	11,076	11,032	32.0#	18.4
1999	600	769,606	769,606	72	10,759	10,759	33.1#	19.0

*Source: Valuation New Zealand Rural Property Sales Statistics (Table D3). * Price per kg milksolids has been derived from price per kg milkfat. ** Adjusted using the Consumers Price Index (based to June 1999) for the end of the June quarter. # Price per kg milkfat has been derived from price per kg milksolids. NOTE: Price per milksolids for 1978 to 1995 has been derived from price per kg milkfat*

- ***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



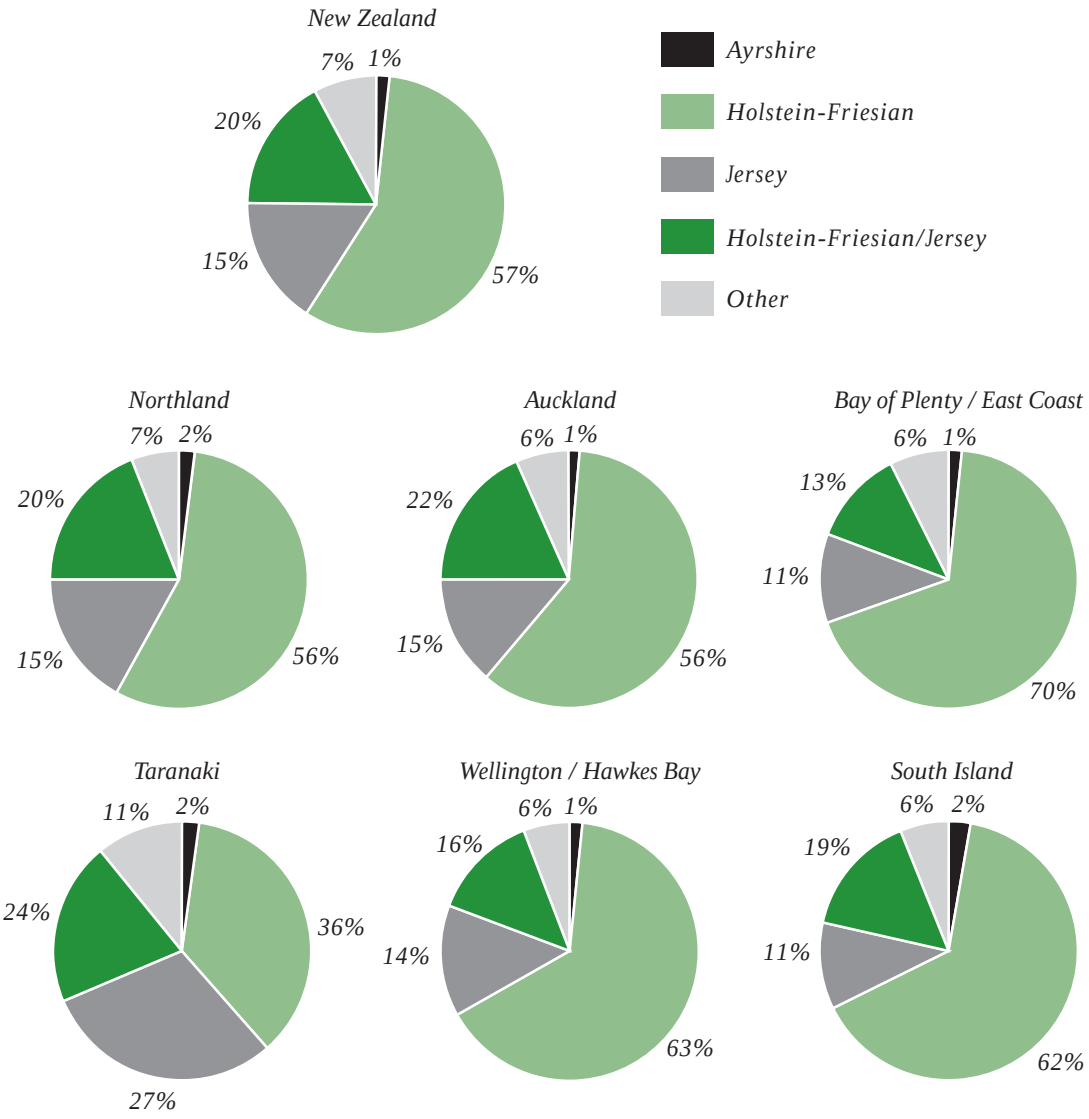
B. Breed breakdown

Three dairy breeds (Holstein-Friesian, Jersey and 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.

The percentages of the major dairy breeds in 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. Bay of Plenty/East Coast region has the highest percentage of Holstein-Friesian cows (70%), whereas Taranaki has the highest proportion of Jersey cows (27%) and Holstein-Friesian/Jersey cross-breds (24%).

Graph 5.3: **Breed percentages of cows in each region in 1999/00**



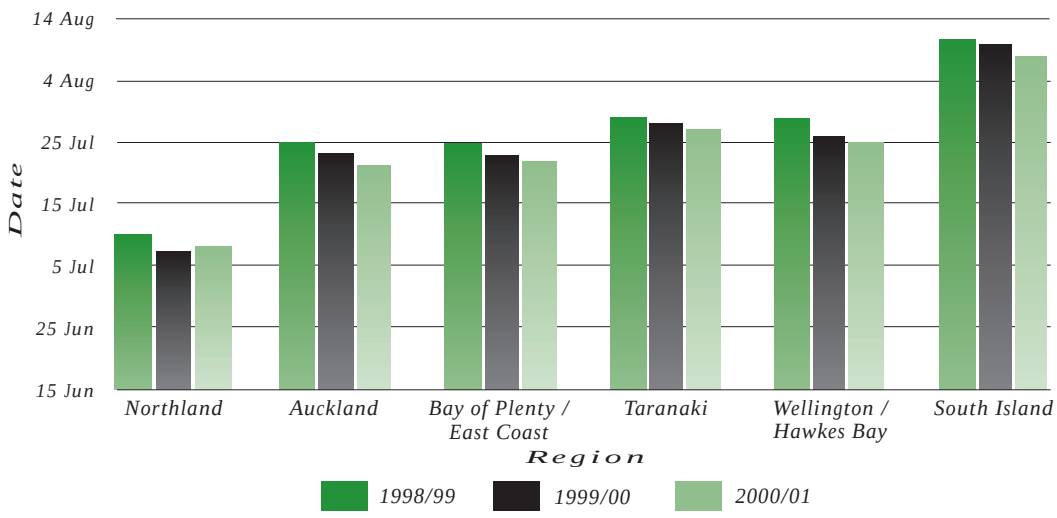
C. Planned start of calving and median calving dates

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 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.

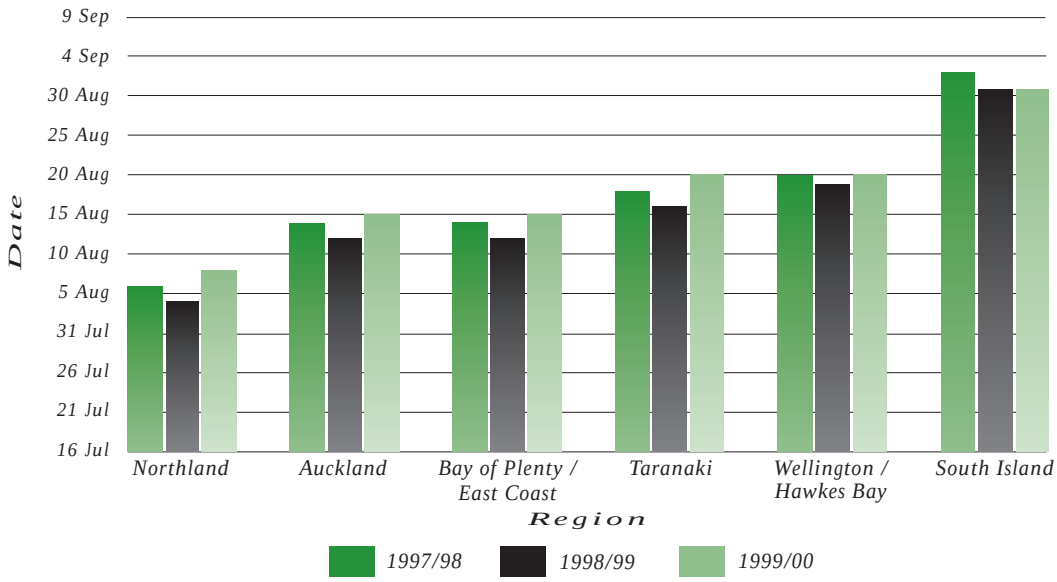
The forecast planned start of calving dates for mature cows for the 2000/01 season compared to the dates previously forecast for 1998/99 and 1999/00 seasons are shown in Graph 5.4.

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 1997/98, 1998/99 and 1999/00 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. They 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 the 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 1999/00, 126 (0.9%) of New Zealand dairy farms operated under a contract milking agreement.

- **62.7% of all farm operating structures are owner operators**
- **Variable order sharemilkers show the highest per cow production level**
- **Relative percentage of farms in each operating structure has remained constant**

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. The table shows that 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. The table also shows that all farm operating structures have, on average, the same stocking rates.

Agreements other than the common 29%, 39% and 50% agreements are shown as combined groups in Table 5.3. In 1999/00, 36.4% of New Zealand dairy farms operated under a sharemilking agreement.

Table 5.3: 1999/00 Herd analysis by operating structure

Operating structure	Number of herds	Average herd size	Average effective hectares	Average cows per effective hectare
Owner-operators	8,694	219	87	2.7
Contract milkers	126	288	112	2.7
Sharemilkers:				
Less than 20%	162	307	121	2.7
20-28%	1,093	265	103	2.7
29%	98	219	91	2.5
30-38%	264	248	101	2.7
39%	66	181	76	2.5
40-44%	78	218	90	2.6
50/50 (45-55%)	3,280	267	105	2.7
All sharemilkers	5,041	264	104	2.7
All farms	13,861	236	93	2.7

Farm production in each of the main operating structure groups is shown in Table 5.4. The table shows that on average, contract milkers and lower order sharemilkers have higher production per farm than higher order sharemilkers, who have higher production per farm than owner operators. Lower order sharemilkers show the highest per cow production level.

Table 5.4: 1999/00 Farm production analysis by operating structure

Operating structure	Average litres per farm	Average kg milkfat per farm	Average kg protein per farm	Average kg milkfat per effective hectare	Average kg protein per effective hectare	Average kg milkfat per cow	Average kg protein per cow
Owner-operators	763,952	36,623	27,599	426	320	160	120
Contract milkers	1,060,680	50,764	38,094	464	347	173	129
Sharemilkers:							
Less than 20%	1,154,461	56,011	42,096	473	354	176	131
20 – 28%	967,293	47,051	35,217	474	354	175	130
29%	773,175	37,698	28,220	433	323	170	127
30 – 38%	883,661	42,726	32,154	452	339	168	126
39%	599,176	30,089	22,133	415	306	163	120
40 – 44%	754,551	37,167	27,798	417	312	164	122
50/50 (45-55%)	976,560	47,055	35,480	457	343	172	128
All Sharemilkers	963,073	46,558	35,027	460	344	172	129
All farms	839,066	40,365	30,396	439	329	165	123

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 1989/90 to 1999/00, whereas, Table 5.6 gives the actual number of farms.

Table 5.5: Trend in the percentage of farms in each operating structure since 1989/90

Operating structure	*1989/90*	*1990/91*	*1991/92*	*1992/93*	*1993/94*	*1994/95*	*1995/96*	*1996/97*	*1997/98*	*1998/99*	*1999/00*
Owner-operators	64.1	62.8	–	56.7	57.2	65.7	65.0	63.6	63.1	62.7	62.7
Contract milkers	3.0	0.9	–	–	0.7	0.6	0.8	1.3	1.2	1.1	0.9
Sharemilkers:											
29%	2.2	2.2	–	0.9	0.8	1.1	0.9	0.8	0.8	0.8	0.7
39%	2.5	1.0	–	0.9	0.7	0.9	0.9	0.7	0.6	0.5	0.5
50%	18.3	21.4	–	19.4	18.6	24.9	24.5	23.4	24.0	23.7	23.7
Other	1.5	3.2	–	4.0	4.0	6.8	7.8	9.3	10.2	11.2	11.5
All Sharemilkers	24.4	27.7	–	25.1	24.1	33.7	34.2	34.3	35.7	36.2	36.4
Unknown	8.5	8.6	100.0	18.2	18.0	0.0	0.0	0.9	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	100.0	100.0

– Not available

From 1989/90 owner-operators includes leased farms

Table 5.6: Trend in the number of farms in each operating structure since 1989/90

Operating Structure	*1989/90*	*1990/91*	*1991/92*	*1992/93*	*1993/94*	*1994/95*	*1995/96*	*1996/97*	*1997/98*	*1998/99*	*1999/00*
Sharemilkers											
Owner-operators	9,349	9,220	–	8,201	8,344	9,627	9,581	9,368	9,263	9,005	8,694
Contract milkers	444	130	–	–	97	84	121	195	172	154	126
Sharemilkers:											
29%	314	322	–	130	118	158	133	120	124	114	98
39%	363	146	–	126	108	138	138	108	95	76	66
50%	2,667	3,140	–	2,803	2,714	3,642	3,614	3,455	3,522	3,403	3,280
Other	220	467	–	572	583	994	1,149	1,367	1,497	1,610	1,597
All Sharemilkers	3,564	4,075	–	3,631	3,523	4,932	5,034	5,050	5,238	5,203	5,041
Unknown	1,238	1,260	14,452	2,626	2,633	6	0	128	0	0	0
Total	14,595	14,685	14,452	14,458	14,597	14,649	14,736	14,741	14,673	14,362	13,861

– Not available

From 1989/90 owner-operators includes leased farms

For the years 1984/85 to 1987/88 farm numbers in each operating type were estimated from the total number of factory supply herds and published percentages

6. Disease control

A. Enzootic Bovine Leucosis (EBL) control scheme

- ***2.5% of herds have a positive EBL Status***
- ***A decline in confirmed positive herds from 674 to 344***
- ***5596 herds (40%) achieve a "Free" herd status***

Enzootic Bovine Leucosis (EBL) is a slow spreading viral disease that affects the immune system of cattle by attacking white blood cells. The virus can be spread by any action that exposes healthy animals to blood or milk from infected animals. A small percentage (5%) of animals affected by the EBL virus will develop a fatal cancer.

The New Zealand Dairy Industry implemented a control scheme in 1997 with the aim of eradicating this disease by 2005. International recognition of New Zealand dairy herds becoming "EBL – Free" is expected to confer long-term marketing advantages for product and animal exports.

At the end of the 1999/2000 season 206 herds (59.9%) had culled the confirmed positive stock and require re-testing in 2000/2001 to determine herd status. Of the herds that still had known positives, 92 herds (26.7%) have less than 6 positive cows. A further 20 herds had from 6 to 10 positive cows (5.8%). Only 26 herds had more than 10 positive cows (7.6%). Table 6.1 provides a summary of progress that has been made since the 1997/98 season.

The virus that causes EBL is not easily spread and the disease can be controlled within herd using well-proven methods. New cases within high incidence rate herds is not uncommon, however with control measures now in place for the fourth season it is expected that fewer new cases will be seen. The EBL control scheme contracts veterinarians to assist herd owners/managers of infected herds, by providing technical advice and implementing management plans.

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

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

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 1999/00 the number of infected dairy herds (131) remains similar to the previous season (135).

Table 6.2: 1999/00 Tuberculosis (Tb) testing and results

Region	Vector status	Number of infected dairy herds June 2000	Number of dairy cattle primary tested	Number of Tuberculous# dairy cattle
Northland	Free	0	110,018	0
Auckland	Free	0	50,748	0
	Risk	0	10,863	0
Waikato	Free	9	1,187,504	96
	Risk	8	154,451	55
Bay of Plenty	Free	1	112,069	5
Gisborne	Free	0	868	0
Hawkes Bay	Free	1	15,911	1
	Risk	0	2,928	0
Taranaki	Free	1	183,157	1
Manawatu / Wanganui	Free	1	112,371	1
	Risk	4	70,040	20
Wellington	Risk	15	110,347	22
Nelson / Marlborough	Free	1	43,548	1
	Risk	2	11,279	2
West Coast	Free	1	2,429	2
	Risk	59	139,148	95
Canterbury	Free	1	118,301	2
	Risk	7	79,701	10
Otago	Free	5	65,056	7
	Risk	12	67,422	31
Southland	Free	3	120,645	21
	Risk	0	20,766	0
North Island	Free	13	1,772,646	104
	Risk	27	348,629	97
North Island	Total	40	2,121,275	201
South Island	Free	12	349,979	33
	Risk	79	318,316	138
South Island	Total	91	668,295	171
New Zealand	Free	25	2,122,625	137
	Risk	106	666,945	235
New Zealand	Total	131	2,789,570	372

Sourced from Animal Health Board – Annual Report for the year ending 30 June 2000
 # 'Tuberculous Animals' include lesioned reactor cattle and lesioned cull cattle