# 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.

*1998/99 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

- ***4.8 % decrease in milksolids***

In 1998/99, eight co-operatively owned dairy companies processed 850 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 850 million kilograms, total milksolids processed into export products in 1998/99 represented a 4.8% decrease from the 893 million kilograms in 1997/98.

Notable changes in the structure of the dairy companies for the 1998/99 season were the mergers of the South Island Dairy Co-operative Ltd and Alpine Dairy Products to form SIDCO, which later merged with the New Zealand Dairy Group of Companies (NZDG). During the 1998/99 season Cadbury Confectionery Ltd merged with Kiwi Co-op Dairies Ltd.

### i) Production

- ***Production down for 1998/99***

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

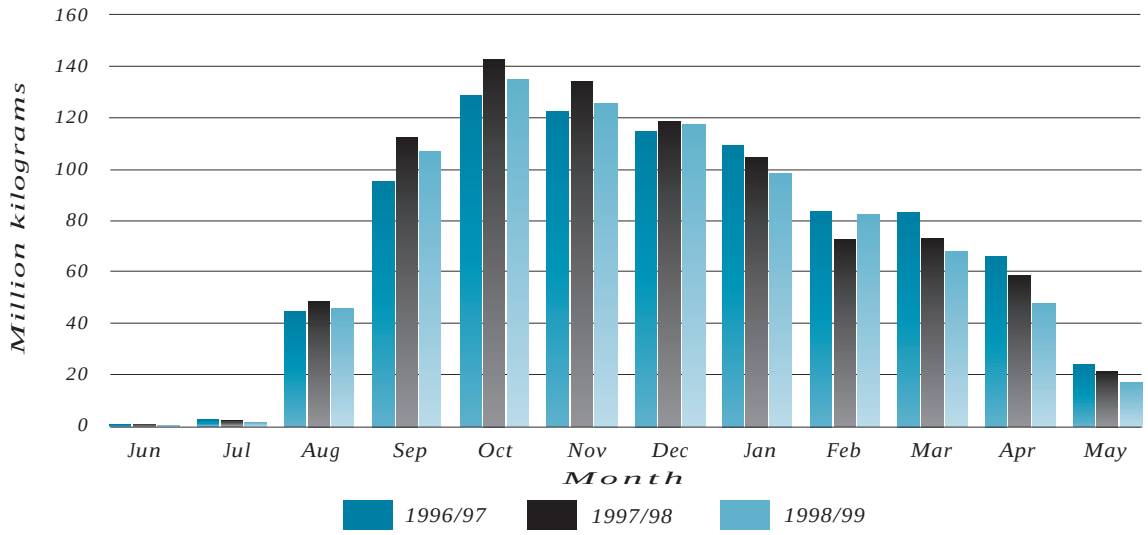
**Table 2.1: Summary of milk production statistics since 1974/75**

| 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 | 379 | 893 |
| 1998/99 | 10,168 | 486 | 363 | 850 |

*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 1998/99 season milksolids curve to the previous two seasons (Graph 2.1), the 1998/99 season production was lower than in the previous season and lower than in 1996/97 from January until the end of the season, with the exception of February. Production peaked in October and generally maintained a lower level than in the previous season, due to the unfavourable spring and summer climatic conditions.

**Graph 2.1: Seasonal trend in total milksolids processed**




## ii) Population

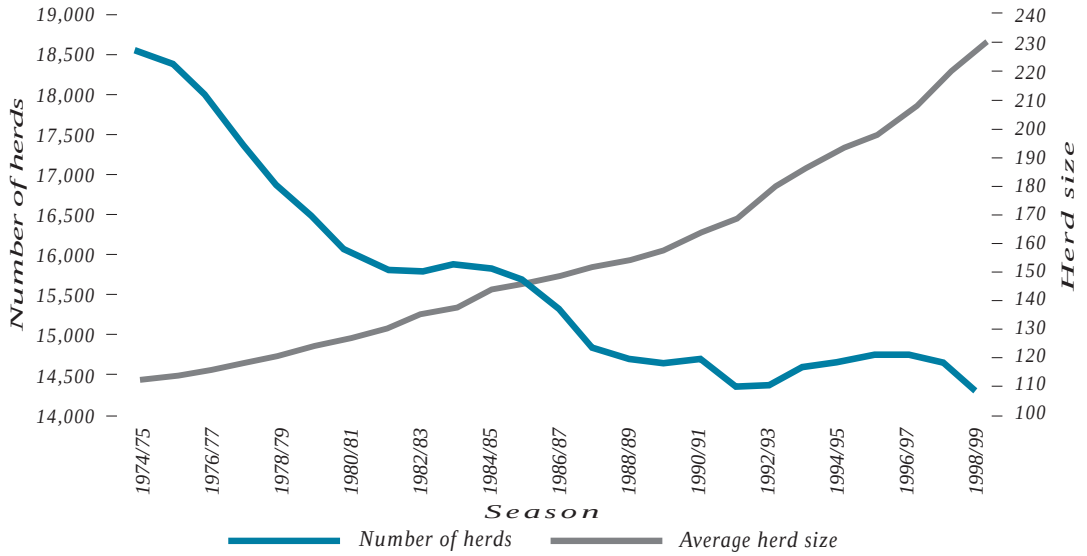
- ***Decrease in herd numbers***
- ***Increase in average herd size***
- ***2% increase in cow numbers***

Total herd numbers decreased in the 1998/99 season from 14,673 to 14,362, caused by amalgamations of farms as well as genuine cessation of supply. Historically there has been a gradual decline in total herds in the nine seasons from 1983/84, with an increase recorded from 1992/93 to 1996/97.

The average herd size has increased in 1998/99, increasing from 220 cows in 1997/98 to 229 for the 1998/99 season. This rise continues the upward trend recorded from 1960/61 season.

The trend in herd numbers (shown by number of suppliers) and herd size since the 1974/75 season is shown in Graph 2.2. The trend of increasing herd size and a decrease in herd numbers continues.

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



The total cow population increased in the 1998/99 season to 3.29 million (Table 2.2), a 2% increase from 3.22 million cows in 1997/98. Effective hectares and average cows per hectare have increased in 1998/99, consistent with the 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 | NA | NA |
| 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 |

*– 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

- ***3.7% decrease in milkfat production per farm***
- ***8.8% decrease in milkfat production per hectare***
- ***12.5% decrease in milkfat production per cow***

Average milkfat and protein per farm decreased in 1998/99. Production per cow decreased in the 1998/99 season to an average of 147kg milkfat and 109kg of protein (Table 2.3). The information contained in table 2.3 is useful to farmers for the comparison of their farm production to that of dairy company national average production data.

A different method to that used in 1992/93 was used to calculate the number of cows, with the effect that reported cow numbers rose slightly in these seasons, and reported levels of production per cow decreased for these seasons.

### *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 | – | NA | – | 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 |

*– not available*

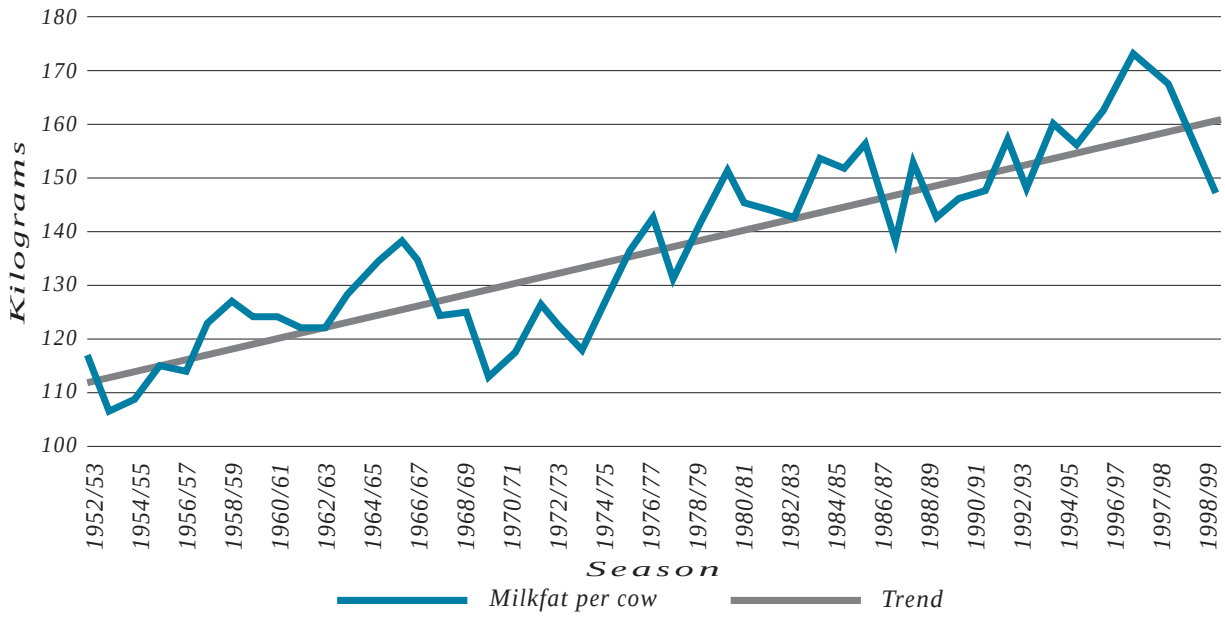
* *1991/92 figures include some town milk herds*

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

## i) Production per cow

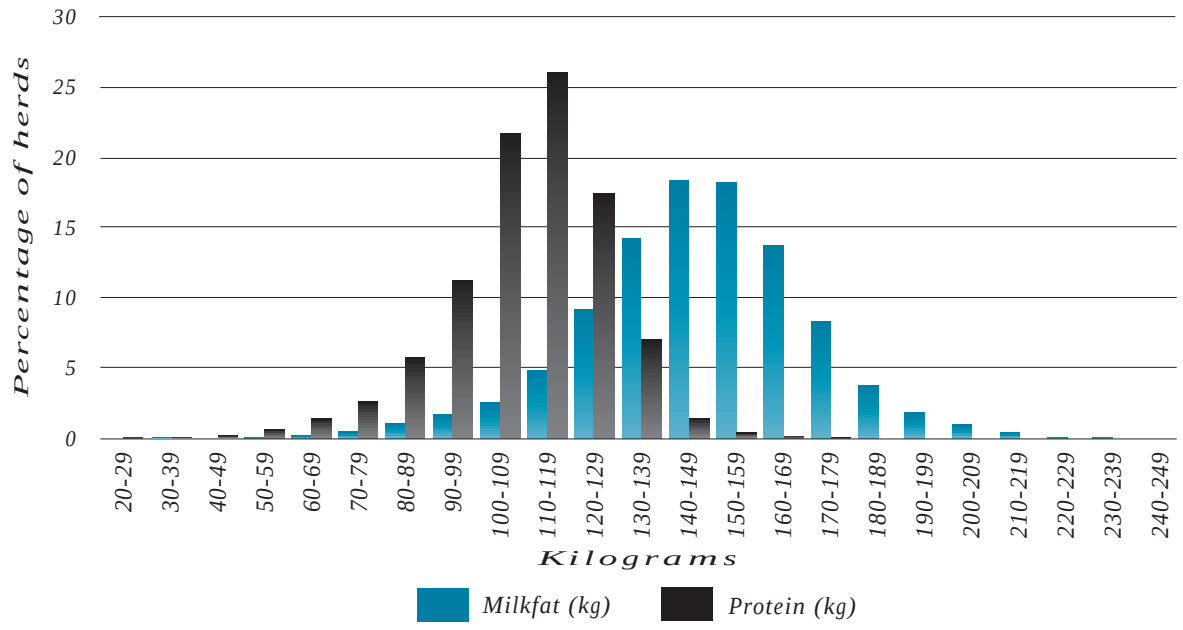
The trend of increased production per cow over the last 45 years (Graph 2.3) is due to genetic gain and improvements in farm management. These improvements from season to season are masked by the considerable effect of the weather on each season's actual production. For example, unfavourable weather 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 1997/98 and 1998/99 seasons.

***Graph 2.3:*** **Trend in milkfat production per cow since 1952/53**




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 1998/99**



## ii) Herd size distribution

- ***18.2% of herds have 300 or more cows***
- ***47.6% of all herds have between 150 and 249 cows***

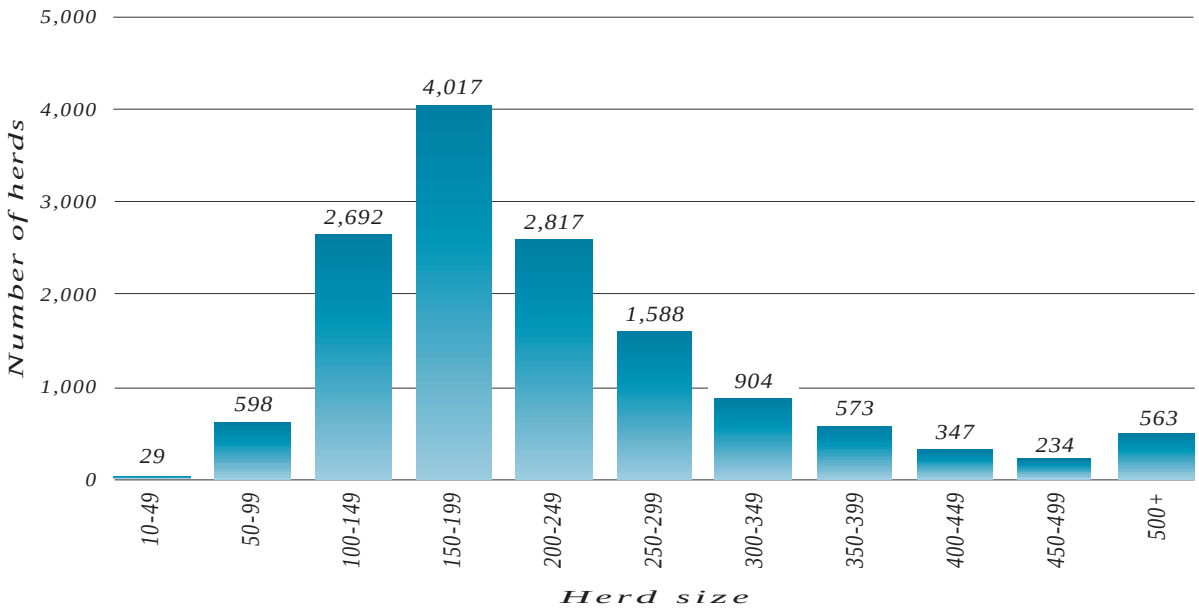
The average dairy herd size in 1998/99 was 229 cows. The number of herds with 300 or more cows has been increasing since 1970/71 until 1998/99, where a minimal decrease of 0.4% was recorded (Table 2.4). In 1998/99, 2,621 herds had 300 or more cows or 18.2% of all herds (Table 2.4).

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

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

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

***Graph 2.5:*** **Herd size distribution in 1998/99**



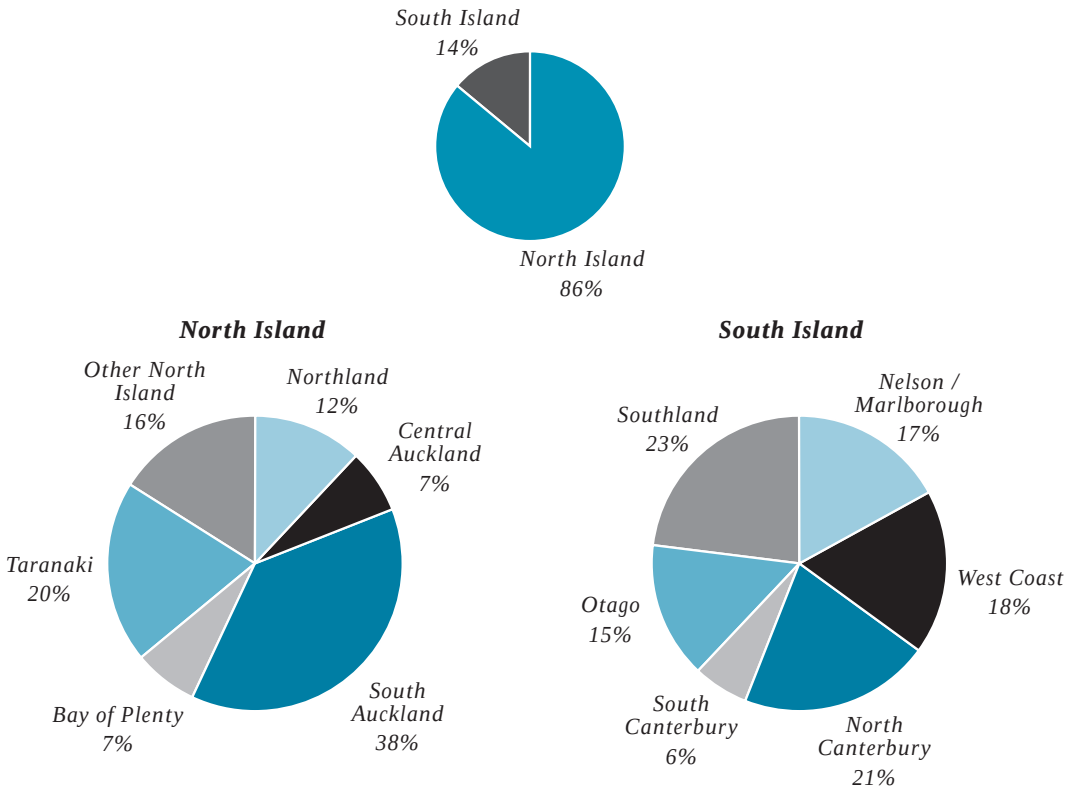
# 3. Regional dairy statistics

- ***No change in the distribution of the number of dairy farms from 1997/98 to 1998/99***

During the 1998/99 season, eight of the 15 dairy companies mainly supplied product for export (seasonal supply) and seven supplied the domestic market (town supply).

The distribution of dairy farms in 1998/99 has remained the same as the previous season. South Island farms account for 14% of the national total.

***Graph 3.1:*** **Regional distribution of dairy farms in 1998/99**




The number of dairy cows increased by 2% from 1997/98 to 1998/99, with the North Island cow population rising by 0.9% (from 2,596,727 to 2,620,567) and the South Island cow population rising by 6.8% (from 625,864 to 668,752). The rate of increase for both the North and South Islands is less than 1997/98.

## • Larger average herd size in the South Island

Farms in the South Island region are on average, larger both in terms of physical size and cow numbers than those in the North Island. Within the South Island, South Canterbury has the largest average herd size with 437 cows. In the North Island Hawkes Bay has the largest average herd size with 347 cows (Table 3.1).

### Table 3.1: 1998/99 Herd analysis by region

| Farming region | Total herds | Total cows | Average herd size | Average effective hectares | Average cows per hectare |
|---|---|---|---|---|---|
| Northland | 1,491 | 290,898 | 195 | 98 | 2.1 |
| Central Auckland | 807 | 151,570 | 188 | 83 | 2.4 |
| South Auckland | 4,765 | 991,591 | 208 | 77 | 2.8 |
| Bay of Plenty | 818 | 188,375 | 230 | 86 | 2.8 |
| Central Plateau | 494 | 148,997 | 302 | 124 | 2.6 |
| Western Uplands | 78 | 19,206 | 246 | 111 | 2.4 |
| East Coast | 19 | 3,761 | 198 | 72 | 2.9 |
| Hawkes Bay | 66 | 22,887 | 347 | 140 | 2.5 |
| Taranaki | 2,453 | 481,034 | 196 | 74 | 2.8 |
| Wellington | 712 | 172,334 | 242 | 97 | 2.7 |
| Wairarapa | 632 | 149,914 | 237 | 92 | 2.7 |
| North Island | 12,335 | 2,620,567 | 212 | 84 | 2.7 |
| Nelson/Marlborough | 343 | 78,571 | 229 | 91 | 2.7 |
| West Coast | 371 | 80,787 | 218 | 118 | 2.0 |
| North Canterbury | 432 | 177,579 | 411 | 148 | 2.9 |
| South Canterbury | 112 | 48,915 | 437 | 163 | 2.9 |
| Otago | 302 | 112,577 | 373 | 139 | 2.8 |
| Southland | 467 | 170,323 | 365 | 139 | 2.7 |
| South Island | 2,027 | 668,752 | 330 | 130 | 2.6 |
| New Zealand | 14,362 | 3,289,319 | 229 | 91 | 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 73,467 kilograms of milkfat and 56,522 kilograms of protein. In the North Island the Hawkes Bay region recorded the highest average farm production with 54,731 kilograms of milkfat and 41,540 kilograms of protein (Table 3.2).

In 1998/99 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. At a regional level this translates to a higher protein to milkfat ratio for the East Coast of the South Island for the 1998/99 season.

**Table 3.2: 1998/99 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 | 584,564 | 27,267 | 20,510 | 284 | 213 | 135 | 101 |
| Central Auckland | 569,315 | 26,211 | 19,911 | 325 | 246 | 135 | 102 |
| South Auckland | 651,280 | 31,077 | 23,200 | 410 | 305 | 145 | 108 |
| Bay of Plenty | 735,661 | 34,088 | 25,659 | 400 | 300 | 143 | 107 |
| Central Plateau | 1,013,650 | 47,567 | 35,419 | 400 | 297 | 155 | 115 |
| Western Uplands | 775,020 | 36,323 | 27,198 | 340 | 255 | 144 | 108 |
| East Coast | 624,979 | 29,821 | 22,295 | 426 | 317 | 149 | 111 |
| Hawkes Bay | 1,177,029 | 54,731 | 41,540 | 383 | 290 | 152 | 115 |
| Taranaki | 607,462 | 31,027 | 22,650 | 426 | 311 | 153 | 111 |
| Wellington | 782,695 | 35,852 | 27,206 | 374 | 284 | 142 | 107 |
| Wairarapa | 768,307 | 36,858 | 27,468 | 407 | 302 | 151 | 112 |
| North Island | 666,414 | 31,879 | 23,776 | 389 | 289 | 145 | 108 |
| Nelson/Marlborough | 734,258 | 34,896 | 25,494 | 389 | 283 | 148 | 107 |
| West Coast | 667,206 | 33,553 | 23,997 | 294 | 209 | 152 | 108 |
| North Canterbury | 1,506,616 | 69,929 | 53,595 | 461 | 355 | 160 | 123 |
| South Canterbury | 1,592,985 | 73,467 | 56,522 | 464 | 359 | 162 | 125 |
| Otago | 1,343,833 | 61,705 | 47,715 | 449 | 347 | 157 | 122 |
| Southland | 1,304,457 | 61,304 | 47,627 | 443 | 344 | 164 | 127 |
| South Island | 1,156,229 | 54,326 | 41,333 | 412 | 313 | 157 | 119 |
| New Zealand | 735,544 | 35,047 | 26,254 | 392 | 292 | 147 | 109 |

Central Otago has the largest farms and highest herd size with an average herd size of 704 cows and an average of 260 hectares (Table 3.3). Matamata-Piako (in South Auckland) is the district with the most herds with 1,426 herds, while South Taranaki is the district with the most cows (292,999).

## Table 3.3: 1998/99 Herd analysis by district

| Region | District | Total herds | Total cows | Average herd size | Average effective hectares | Average cows per hectare |
|---|---|---|---|---|---|---|
| Northland | Far North | 422 | 77,537 | 184 | 93 | 2.1 |
| | Whangarei | 475 | 98,847 | 208 | 105 | 2.1 |
| | Kaipara | 594 | 114,514 | 193 | 96 | 2.1 |
| Central Auckland | Rodney | 304 | 53,061 | 175 | 86 | 2.2 |
| | Manukau | 32 | 7,096 | 222 | 76 | 2.9 |
| | Papakura | 18 | 4,378 | 243 | 93 | 2.7 |
| | Franklin | 453 | 87,035 | 192 | 81 | 2.5 |
| South Auckland | Thames-Coromandel | 124 | 24,459 | 197 | 84 | 2.5 |
| | Hauraki | 568 | 112,216 | 198 | 76 | 2.7 |
| | Waikato | 941 | 197,638 | 210 | 81 | 2.7 |
| | Matamata-Piako | 1,426 | 277,181 | 194 | 68 | 3.0 |
| | Hamilton | 10 | 1,891 | 189 | 78 | 2.6 |
| | Waipa | 791 | 170,616 | 216 | 79 | 2.9 |
| | Otorohanga | 465 | 106,218 | 228 | 85 | 2.8 |
| | South Waikato | 439 | 100,888 | 230 | 85 | 2.8 |
| Bay of Plenty | Western Bay of Plenty | 299 | 67,486 | 226 | 85 | 2.7 |
| | Tauranga | 10 | 2,379 | 238 | 89 | 2.6 |
| | Whakatane | 399 | 94,235 | 236 | 87 | 2.8 |
| | Opotiki | 110 | 24,275 | 221 | 86 | 2.7 |
| Central Plateau | Taupo | 112 | 40,645 | 363 | 163 | 2.4 |
| | Rotorua | 383 | 108,836 | 284 | 113 | 2.7 |
| Western Uplands | Waitomo | 63 | 15,394 | 244 | 110 | 2.4 |
| | Ruapehu | 15 | 3,812 | 254 | 112 | 2.4 |
| East Coast | Gisborne | 8 | 1,500 | 188 | 62 | 3.0 |
| | Wairoa | 11 | 2,261 | 206 | 80 | 2.7 |
| Hawkes Bay | Napier/Hastings | 24 | 8,796 | 367 | 153 | 2.3 |
| | Central Hawkes Bay | 42 | 14,091 | 335 | 133 | 2.6 |
| Taranaki | New Plymouth | 638 | 117,456 | 184 | 73 | 2.6 |
| | Stratford | 399 | 70,579 | 177 | 69 | 2.7 |
| | South Taranaki | 1,416 | 292,999 | 207 | 75 | 2.9 |
| Wellington | Wanganui | 29 | 7,570 | 261 | 118 | 2.4 |
| | Rangitikei | 97 | 26,220 | 270 | 108 | 2.7 |
| | Manawatu | 325 | 76,021 | 234 | 92 | 2.7 |
| | Palmerston North | 44 | 11,962 | 272 | 109 | 2.6 |
| | Horowhenua | 173 | 41,370 | 239 | 97 | 2.6 |
| | Kapiti Coast | 31 | 7,119 | 230 | 86 | 2.9 |
| | Upper Hutt | 13 | 2,072 | 159 | 67 | 2.5 |
| Wairarapa | Tararua | 406 | 89,471 | 220 | 85 | 2.7 |
| | Masterton | 23 | 7,209 | 313 | 118 | 2.8 |
| | Carterton | 94 | 22,262 | 237 | 88 | 2.8 |
| | South Wairarapa | 112 | 31,888 | 285 | 114 | 2.6 |
| North Island | | 12,335 | 2,620,567 | 212 | 84 | 2.7 |
| Nelson/Marlborough | Tasman | 222 | 49,005 | 221 | 90 | 2.6 |
| | Nelson | 6 | 1,146 | 191 | 67 | 3.0 |
| | Marlborough | 87 | 19,380 | 223 | 86 | 2.8 |
| | Kaikoura | 28 | 9,040 | 323 | 126 | 2.7 |
| West Coast | Buller | 126 | 27,782 | 220 | 105 | 2.2 |
| | Grey | 60 | 14,804 | 247 | 139 | 1.8 |

*Table 3.3 continued*

| Region | District | Total herds | Total cows | Average herd size | Average effective hectares | Average cows per hectare |
|---|---|---|---|---|---|---|
| | Westland | 185 | 38,201 | 206 | 120 | 1.8 |
| North Canterbury | Hurunui | 40 | 22,169 | 554 | 212 | 2.7 |
| | Waimakariri | 70 | 17,018 | 243 | 91 | 2.9 |
| | Christchurch | 11 | 2,832 | 258 | 100 | 2.7 |
| | Banks Peninsula | 14 | 2,134 | 152 | 78 | 2.1 |
| | Selwyn | 151 | 57,399 | 380 | 130 | 3.0 |
| | Ashburton | 146 | 76,027 | 521 | 187 | 2.9 |
| South Canterbury | Timaru | 71 | 26,080 | 367 | 132 | 3.0 |
| | Waimate | 41 | 22,835 | 557 | 217 | 2.7 |
| Otago | Waitaki | 73 | 36,406 | 499 | 180 | 2.9 |
| | Central Otago | 5 | 3,521 | 704 | 260 | 2.9 |
| | Dunedin | 99 | 26,117 | 264 | 98 | 2.8 |
| | Clutha | 125 | 46,533 | 372 | 142 | 2.8 |
| Southland | Southland | 371 | 135,347 | 365 | 140 | 2.7 |
| | Gore | 56 | 21,268 | 380 | 142 | 2.8 |
| | Invercargill | 40 | 13,708 | 343 | 129 | 2.7 |
| South Island | | 2,027 | 668,752 | 330 | 130 | 2.6 |
| New Zealand | | 14,362 | 3,289,319 | 229 | 91 | 2.7 |

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

Central Otago district with five farms has the highest average production per farm with 120,927 kilograms of milkfat per farm and 94,851 kilograms of protein per farm. The North Island district with the highest production is Taupo with an average of 58,759 kilograms of milkfat per farm and 43,832 kilograms of protein per farm (Table 3.4).

### *Table 3.4:* 1998/99 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 | 534,786 | 24,696 | 18,679 | 268 | 202 | 129 | 97 |
| | Whangarei | 634,552 | 30,073 | 22,482 | 293 | 219 | 140 | 105 |
| | Kaipara | 579,956 | 26,849 | 20,234 | 287 | 216 | 135 | 101 |
| Central Auckland | Rodney | 503,355 | 24,044 | 17,856 | 283 | 209 | 132 | 98 |
| | Manukau | 726,199 | 31,285 | 24,636 | 414 | 324 | 141 | 111 |
| | Papakura | 805,249 | 34,977 | 27,557 | 378 | 293 | 141 | 110 |
| | Franklin | 593,122 | 26,960 | 20,652 | 344 | 263 | 135 | 103 |
| South Auckland | Thames-Coromandel | 603,922 | 28,090 | 21,123 | 338 | 254 | 138 | 103 |
| | Hauraki | 603,115 | 28,453 | 21,358 | 382 | 287 | 141 | 106 |
| | Waikato | 656,458 | 30,710 | 32,140 | 383 | 288 | 142 | 106 |
| | Matamata-Piako | 598,753 | 29,166 | 21,600 | 433 | 320 | 146 | 108 |
| | Hamilton | 576,738 | 28,631 | 20,944 | 369 | 267 | 140 | 101 |
| | Waipa | 685,223 | 32,595 | 24,392 | 419 | 313 | 146 | 109 |
| | Otorohanga | 731,286 | 35,018 | 26,048 | 416 | 309 | 149 | 110 |
| | South Waikato | 742,103 | 35,442 | 26,371 | 425 | 315 | 151 | 112 |
| Bay of Plenty | Western Bay of Plenty | 705,588 | 33,201 | 24,878 | 392 | 293 | 143 | 107 |
| | Tauranga | 767,916 | 35,128 | 26,726 | 370 | 280 | 141 | 107 |
| | Whakatane | 765,198 | 35,047 | 26,492 | 411 | 310 | 144 | 108 |
| | Kawerau | 1,046,084 | 53,346 | 39,214 | 364 | 269 | 127 | 94 |
| | Opotiki | 707,336 | 32,922 | 24,666 | 381 | 285 | 143 | 106 |
| Central Plateau | Taupo | 1,250,961 | 58,759 | 43,832 | 372 | 276 | 158 | 118 |
| | Rotorua | 944,254 | 44,295 | 32,960 | 408 | 303 | 154 | 114 |

*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 |
|---|---|---|---|---|---|---|---|---|
| Western Uplands | Waitomo | 765,023 | 36,218 | 26,933 | 340 | 253 | 145 | 108 |
| | Ruapehu | 817,009 | 36,765 | 28,311 | 340 | 263 | 141 | 109 |
| East Coast | Gisborne | 595,399 | 28,591 | 21,288 | 465 | 343 | 155 | 114 |
| | Wairoa | 646,493 | 30,715 | 23,028 | 398 | 298 | 145 | 108 |
| Hawkes Bay | Napier/Hastings | 1,220,557 | 56,160 | 42,504 | 337 | 256 | 146 | 110 |
| | Central Hawkes Bay | 1,152,156 | 53,914 | 40,989 | 410 | 309 | 155 | 117 |
| Taranaki | New Plymouth | 558,849 | 28,155 | 20,511 | 388 | 282 | 147 | 107 |
| | Stratford | 534,221 | 26,753 | 19,653 | 387 | 284 | 146 | 107 |
| | South Taranaki | 650,003 | 33,526 | 24,458 | 455 | 331 | 158 | 115 |
| Wellington | Wanganui | 835,686 | 37,499 | 28,581 | 330 | 249 | 139 | 106 |
| | Rangitikei | 889,297 | 42,484 | 31,774 | 402 | 301 | 151 | 113 |
| | Manawatu | 752,833 | 34,707 | 26,257 | 374 | 282 | 141 | 106 |
| | Palmerston North | 879,711 | 39,980 | 30,408 | 378 | 285 | 142 | 107 |
| | Horowhenua | 775,562 | 34,711 | 26,602 | 367 | 281 | 140 | 107 |
| | Kapiti Coast | 748,515 | 32,277 | 25,093 | 394 | 306 | 138 | 107 |
| | Upper Hutt | 463,690 | 21,055 | 16,005 | 314 | 238 | 129 | 98 |
| Wairarapa | Tararua | 700,848 | 33,980 | 25,232 | 404 | 299 | 150 | 111 |
| | Masterton | 1,058,927 | 49,242 | 37,128 | 431 | 323 | 155 | 116 |
| | Carterton | 784,134 | 36,774 | 27,643 | 422 | 316 | 151 | 113 |
| | South Wairarapa | 938,074 | 44,743 | 33,388 | 399 | 297 | 155 | 115 |
| North Island | | 666,414 | 31,879 | 23,776 | 389 | 289 | 145 | 108 |
| Nelson/Marlborough | Tasman | 695,496 | 33,655 | 24,295 | 383 | 275 | 148 | 106 |
| | Nelson | 630,876 | 26,865 | 20,960 | 417 | 323 | 148 | 114 |
| | Marlborough | 712,274 | 32,794 | 24,360 | 392 | 289 | 144 | 106 |
| | Kaikoura | 1,132,052 | 52,985 | 39,489 | 426 | 318 | 159 | 119 |
| West Coast | Buller | 668,405 | 33,178 | 23,750 | 322 | 230 | 146 | 104 |
| | Grey | 787,434 | 38,859 | 28,019 | 287 | 206 | 156 | 112 |
| | Westland | 627,397 | 32,088 | 22,860 | 276 | 197 | 154 | 110 |
| North Canterbury | Hurunui | 2,097,676 | 96,967 | 74,181 | 478 | 365 | 173 | 132 |
| | Waimakariri | 820,763 | 36,099 | 28,145 | 413 | 322 | 142 | 111 |
| | Christchurch | 890,408 | 38,090 | 30,065 | 386 | 306 | 140 | 111 |
| | Banks Peninsula | 432,567 | 19,349 | 14,671 | 258 | 194 | 125 | 94 |
| | Selwyn | 1,394,981 | 63,690 | 49,442 | 471 | 367 | 158 | 123 |
| | Ashburton | 1,938,391 | 92,442 | 69,959 | 494 | 375 | 172 | 130 |
| South Canterbury | Timaru | 1,334,873 | 60,671 | 46,980 | 463 | 360 | 158 | 123 |
| | Waimate | 2,039,958 | 95,627 | 73,046 | 467 | 356 | 169 | 129 |
| Otago | Waitaki | 1,853,746 | 84,470 | 65,727 | 484 | 377 | 166 | 129 |
| | Central Otago | 2,670,151 | 120,927 | 94,851 | 481 | 375 | 169 | 132 |
| | Dunedin | 904,321 | 40,887 | 31,426 | 412 | 317 | 145 | 111 |
| | Clutha | 1,341,084 | 62,529 | 48,210 | 455 | 352 | 162 | 125 |
| Southland | Southland | 1,296,156 | 61,101 | 47,437 | 440 | 342 | 164 | 127 |
| | Gore | 1,396,754 | 64,682 | 50,177 | 466 | 361 | 167 | 130 |
| | Invercargill | 1,252,226 | 58,457 | 45,816 | 434 | 339 | 160 | 125 |
| South Island | | 1,156,229 | 54,326 | 41,333 | 412 | 313 | 157 | 119 |
| New Zealand | | 735,544 | 35,047 | 26,254 | 392 | 292 | 147 | 109 |

# 4. Herd improvement

## A. Use of herd testing

Farmers were offered a number of herd testing options in 1998/99. They were able to choose between Sample Officer Service (where a sample officer is present at the milking to measure milk volumes and take milk sub-samples), 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). The Sample Officer Service received minimal use (less than 30 farms) in the 1998/99 season and has been discontinued in the 1999/2000 season.

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 they tested at eight weekly intervals, or more frequently, they receive information on individual cow's milk, milkfat and protein yields plus 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 fat, milk or protein. Production Worth information is sufficient for farmers to cull for low production.

- ***84% of herds undertake herd testing in 1998/99***

The regional uptake of herd testing services in 1998/99 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 90.4%. Auckland region at 92.2% reported the highest number of cows herd testing.

### *Table 4.1:* Use of herd testing by region in 1998/99

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 | 1,344 | 1,795 | 74.9 | 276,652 | 343,959 | 80.4 |
| Auckland | 5,057 | 5,842 | 86.6 | 1,161,284 | 1,259,214 | 92.2 |
| Bay of Plenty/East Coast | 750 | 830 | 90.4 | 174,329 | 189,973 | 91.8 |
| Taranaki | 2,095 | 2,457 | 85.3 | 423,069 | 481,088 | 87.9 |
| Wellington/Hawkes Bay | 1,178 | 1,411 | 83.5 | 288,274 | 346,333 | 83.2 |
| South Island | 1,635 | 2,027 | 80.7 | 495,370 | 668,752 | 74.1 |
| New Zealand | 12,059 | 14,362 | 84.0 | 2,818,978 | 3,289,319 | 85.7 |

The trend of the percentage of total herds using herd testing has increased since 1955/56 (Graph 4.1). However, both the 1997/98 and 1998/99 seasons have shown a decrease in herds undertaking herd testing (Table 4.2).

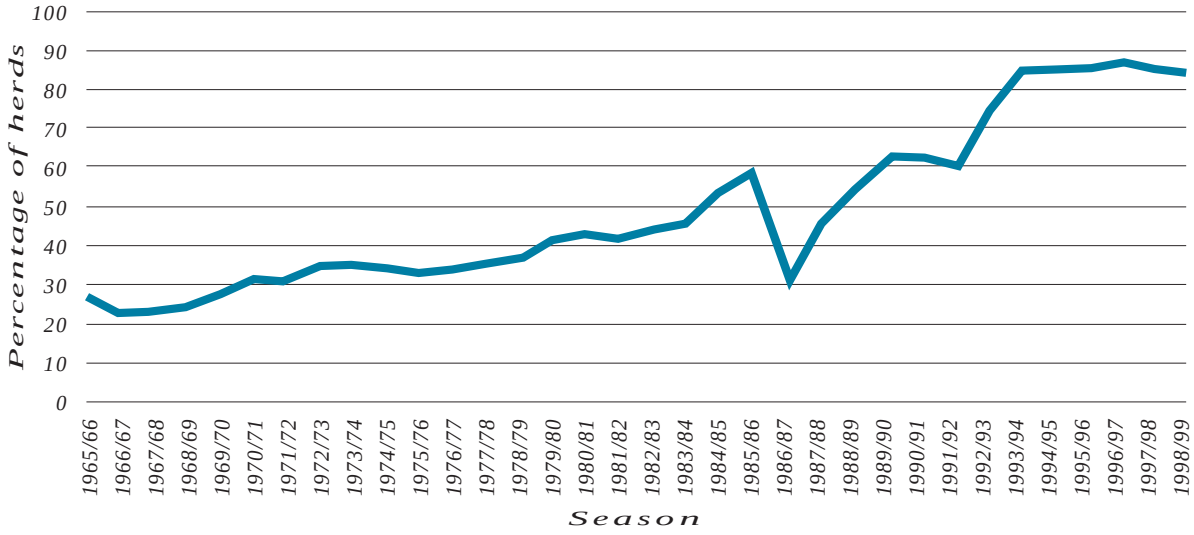
### *Table 4.2*: Trend in the use of herd testing services since 1955/56

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

| *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 | 27.7 | 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 | 31.0 | 716 | 32.0 |
| 1971/72 | 6,274 | 30.3 | 690 | 31.4 |
| 1972/73 | 6,771 | 35.3 | 772 | 35.3 |
| 1973/74 | 6,640 | 35.8 | 780 | 36.4 |
| 1974/75 | 6,436 | 34.9 | 779 | 37.5 |
| 1975/76 | 5,858 | 32.7 | 706 | 33.7 |
| 1976/77 | 5,945 | 34.2 | 725 | 35.0 |
| 1977/78 | 6,159 | 36.4 | 771 | 37.6 |
| 1978/79 | 6,250 | 37.9 | 801 | 39.3 |
| 1979/80 | 6,662 | 41.4 | 871 | 42.6 |
| 1980/81 | 6,789 | 42.9 | 909 | 44.8 |
| 1981/82 | 6,702 | 42.4 | 922 | 44.7 |
| 1982/83 | 7,018 | 44.0 | 995 | 46.8 |
| 1983/84 | 7,430 | 46.8 | 1,092 | 49.4 |
| 1984/85 | 8,445 | 53.6 | 1,294 | 56.8 |
| 1985/86 | 9,026 | 58.9 | 1,484 | 63.9 |
| 1986/87 | 4,555 | 30.7 | 753 | 33.0 |
| 1987/88 | 6,930 | 47.0 | 1,175 | 52.5 |
| 1988/89 | 7,932 | 54.3 | 1,341 | 59.1 |
| 1989/90 | 9,213 | 62.7 | 1,604 | 69.3 |
| 1990/91 | 8,918 | 61.7 | 1,566 | 65.2 |
| 1991/92 | 8,661 | 59.9 | 1,611 | 66.1 |
| 1992/93 | 10,843 | 75.0 | 2,039 | 78.4 |
| 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 |

The percentage of herds using herd testing services (Graph 4.1) shows a drop in the 1986/87 season, coinciding with the low payout received by farmers in that season which had the effect of reducing expenditure on herd testing compared with previous and later seasons.

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




# B. Herd test averages

## i) Season averages

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

The lactation yield figures in this section are for cows herd tested. Before September 1998 the herd testing system calculated lactation yields for all tested cows in herds that tested four or more times during the season. After this time all cows herd tested once or more during the season were included in the calculation, only including cows that lactated for one hundred days or more. In comparison, the average milkfat figures given in Sections 2 and 3 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 slightly reduces the average lactation.

There has been additional information presented 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 factored for calving spread. The new methodology will provide a more accurate measure of the average lactation length of dairy cows.

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 (3,982 litres), milkfat (179 kg) and protein (141 kg) of cows herd tested.

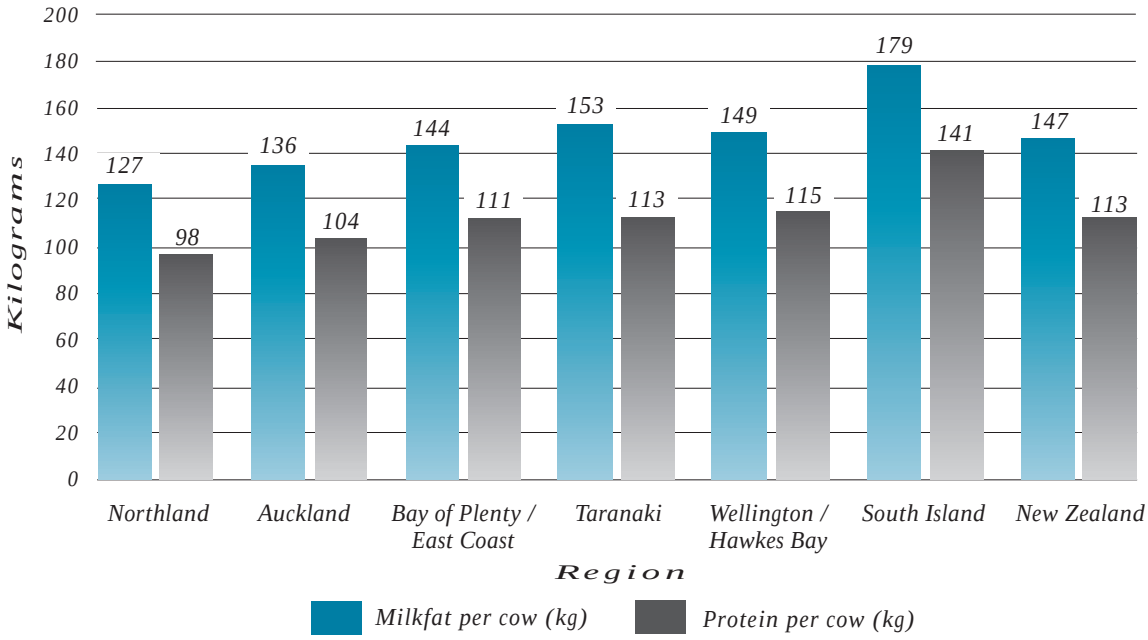
Information reported in Table 4.3 contains aggregated herd test data which can be useful to farmers for comparison with individual farm herd test data.

## Table 4.3: 1998/99 Season herd test averages 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 | 2,866 | 127 | 4.40 | 98 | 3.38 | 214 | 205 | 297 |
| Auckland | 2,971 | 136 | 4.41 | 104 | 3.36 | 202 | 188 | 270 |
| Bay of Plenty / East Coast | 3,256 | 144 | 4.39 | 111 | 3.40 | 215 | 208 | 276 |
| Taranaki | 3,030 | 153 | 4.97 | 113 | 3.66 | 211 | 206 | 277 |
| Wellington / Hawkes Bay | 3,277 | 149 | 4.45 | 115 | 3.42 | 208 | 215 | 284 |
| South Island | 3,982 | 179 | 4.45 | 141 | 3.49 | 218 | 218 | 272 |
| New Zealand | 3,189 | 147 | 4.51 | 113 | 3.44 | 208 | 200 | 277 |

The 1998/99 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 127 to 179 kg per cow and protein production from 98 to 141 kg per cow. While the South Island region had the highest overall production with 179 kilograms of milkfat and 141 kilograms of protein per cow, it had the lowest proportion of cows herd tested.

## Graph 4.2: Average milkfat and protein production per cow in 1998/99



### • Decrease in production per cow for 1998/99

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 eight years (Table 4.4).

Additional information for the days in milk figure has been included for the last two seasons. This figure (shown in brackets) 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 | 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 (277*) | 200 |

*– not available*

**derived from milk supply information*

## ii) Monthly averages

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

Before September 1998 monthly herd test averages include all herds scheduled for four or more tests during the season. After this time all cows herd tested in each month were included, where 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 therefore are affected by milk volume. Statistics for May, June and July are based on far fewer cows than are other months, because 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:* 1998/99 Monthly herd test averages by region

Average litres of milk per cow per day

| Livestock Improvement Region | 1998 June | July | Aug | Sept | Oct | Nov | Dec | 1999 Jan | Feb | Mar | April | May | Season average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Northland | 14.04 | 13.08 | 14.77 | 15.58 | 15.56 | 14.45 | 13.18 | 11.68 | 11.23 | 8.45 | 7.61 | 11.84 | 12.86 |
| Auckland | 16.55 | 16.05 | 17.6 | 18.59 | 18.47 | 16.5 | 14.94 | 12.06 | 12.04 | 8.10 | 7.36 | 11.72 | 14.16 |
| B.O.P. / East Coast | 15.82 | 13.67 | 17.78 | 19.15 | 18.56 | 16.74 | 15.12 | 13.04 | 12.40 | 9.31 | 8.24 | 12.07 | 14.44 |
| Taranaki | 15.89 | 15.57 | 17.04 | 17.83 | 17.29 | 15.77 | 14.65 | 12.87 | 12.41 | 8.96 | 9.05 | 10.56 | 13.86 |
| Well. / Hawkes Bay | 16.28 | 15.63 | 18.06 | 19.81 | 19.69 | 17.28 | 16.16 | 13.67 | 13.23 | 10.08 | 9.94 | 11.46 | 15.04 |
| South Island | 16.81 | 17.89 | 19.62 | 22.66 | 22.66 | 21.22 | 18.92 | 17.52 | 15.10 | 13.24 | 12.4 | 11.9 | 17.43 |
| New Zealand | 15.98 | 15.9 | 17.03 | 18.59 | 18.94 | 16.96 | 15.65 | 13.2 | 12.76 | 9.37 | 9.58 | 11.74 | 14.67 |

Average kg of milkfat per cow per day

| Livestock Improvement Region | 1998 June | July | Aug | Sept | Oct | Nov | Dec | 1999 Jan | Feb | Mar | April | May | Season average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Northland | 0.59 | 0.57 | 0.64 | 0.66 | 0.67 | 0.64 | 0.58 | 0.53 | 0.53 | 0.43 | 0.40 | 0.55 | 0.58 |
| Auckland | 0.68 | 0.66 | 0.78 | 0.81 | 0.82 | 0.74 | 0.68 | 0.56 | 0.58 | 0.43 | 0.40 | 0.56 | 0.65 |
| B.O.P. / East Coast | 0.65 | 0.58 | 0.77 | 0.8 | 0.8 | 0.72 | 0.67 | 0.57 | 0.58 | 0.46 | 0.43 | 0.57 | 0.64 |
| Taranaki | 0.72 | 0.69 | 0.82 | 0.84 | 0.83 | 0.77 | 0.74 | 0.66 | 0.66 | 0.51 | 0.52 | 0.58 | 0.70 |
| Well. / Hawkes Bay | 0.71 | 0.65 | 0.77 | 0.86 | 0.87 | 0.77 | 0.73 | 0.62 | 0.63 | 0.51 | 0.52 | 0.56 | 0.69 |
| South Island | 0.75 | 0.78 | 0.84 | 0.97 | 0.98 | 0.92 | 0.84 | 0.77 | 0.7 | 0.65 | 0.63 | 0.6 | 0.79 |
| New Zealand | 0.68 | 0.68 | 0.75 | 0.81 | 0.84 | 0.77 | 0.72 | 0.61 | 0.62 | 0.49 | 0.51 | 0.58 | 0.68 |

Average kg of protein per cow per day

| Livestock Improvement Region | 1998 June | July | Aug | Sept | Oct | Nov | Dec | 1999 Jan | Feb | Mar | April | May | Season average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Northland | 0.46 | 0.44 | 0.49 | 0.51 | 0.53 | 0.5 | 0.46 | 0.4 | 0.41 | 0.31 | 0.30 | 0.43 | 0.44 |
| Auckland | 0.54 | 0.52 | 0.61 | 0.63 | 0.64 | 0.58 | 0.53 | 0.41 | 0.43 | 0.3 | 0.29 | 0.44 | 0.50 |
| B.O.P. / East Coast | 0.52 | 0.46 | 0.61 | 0.64 | 0.63 | 0.57 | 0.53 | 0.43 | 0.44 | 0.34 | 0.32 | 0.44 | 0.50 |
| Taranaki | 0.54 | 0.53 | 0.62 | 0.63 | 0.63 | 0.59 | 0.56 | 0.48 | 0.48 | 0.36 | 0.38 | 0.44 | 0.52 |
| Well. / Hawkes Bay | 0.54 | 0.52 | 0.61 | 0.68 | 0.69 | 0.61 | 0.57 | 0.47 | 0.47 | 0.38 | 0.39 | 0.44 | 0.53 |
| South Island | 0.57 | 0.59 | 0.64 | 0.77 | 0.79 | 0.74 | 0.66 | 0.61 | 0.54 | 0.5 | 0.49 | 0.47 | 0.62 |
| New Zealand | 0.53 | 0.53 | 0.58 | 0.63 | 0.66 | 0.6 | 0.56 | 0.46 | 0.46 | 0.35 | 0.38 | 0.46 | 0.52 |

Average somatic cell count (000 cells per millilitre)

| Livestock Improvement Region | 1998 June | July | Aug | Sept | Oct | Nov | Dec | 1999 Jan | Feb | Mar | April | May | Season average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Northland | 218 | 207 | 180 | 168 | 170 | 176 | 192 | 206 | 210 | 251 | 308 | 264 | 205 |
| Auckland | 191 | 218 | 159 | 148 | 149 | 148 | 159 | 189 | 201 | 252 | 309 | 266 | 188 |
| B.O.P. / East Coast | 254 | 235 | 184 | 170 | 158 | 165 | 178 | 204 | 204 | 244 | 296 | 308 | 208 |
| Taranaki | 287 | 251 | 179 | 165 | 171 | 174 | 174 | 184 | 203 | 224 | 241 | 261 | 206 |
| Well. / Hawkes Bay | 247 | 211 | 200 | 179 | 185 | 186 | 191 | 214 | 228 | 258 | 275 | 294 | 215 |
| South Island | 238 | 231 | 215 | 214 | 192 | 199 | 204 | 216 | 229 | 239 | 229 | 238 | 218 |
| New Zealand | 226 | 222 | 175 | 163 | 166 | 166 | 177 | 197 | 209 | 245 | 273 | 256 | 200 |

Average somatic cell count (SCC) information presented in Table 4.5 should not be compared with bulk milk SCC (which is not reported in this publication) as different calculation methods are used for each. Bulk milk SCC is calculated using a weighted average, whereas the figures presented in this table are not.

## iii) Breed averages

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

The 1998/99 herd test statistics were analysed for Holstein-Friesian, Jersey, Ayrshire and Holstein-Friesian/Jersey Crossbreds. Before September 1998 the breed averages listed in Table 4.6 are for cows herd tested four or more times during the season, whereas from September breed averages are for cows herd tested once or more during the season.

The number of days in milk reported is the number of days from the estimated start of lactation to the estimated end of lactation. The estimated 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. Therefore the number of days in milk does not reflect the average lactation length of dairy cows.

On average, the Holstein-Friesian/Jersey Crossbred cows produced more milkfat than the other breeds listed, while the 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 Crossbred cows.

In the Ayrshire breed, 7-year-old cows had higher production than any other age group.

### *Table 4.6:* 1998/99 Herd test breed averages by age of cow

Holstein-Friesian

| *Age* | *Number* | *Days in milk* | *Milk (litres)* | *Milkfat (kg)* | *Protein (kg)* | *Milkfat %* | *Protein %* |
|---|---|---|---|---|---|---|---|
| 2 | 283,702 | 211 | 2,874 | 122.6 | 95.9 | 4.29 | 3.34 |
| 3 | 250,232 | 211 | 3,273 | 142.3 | 112.3 | 4.38 | 3.44 |
| 4 | 218,825 | 212 | 3,623 | 156.4 | 123.5 | 4.34 | 3.42 |
| 5 | 179,488 | 212 | 3,823 | 163.7 | 129.7 | 4.31 | 3.40 |
| 6 | 142,625 | 212 | 3,836 | 165.3 | 131.4 | 4.34 | 3.44 |
| 7 | 115,055 | 210 | 3,763 | 162.6 | 128.9 | 4.34 | 3.43 |
| 8 | 83,172 | 208 | 3,671 | 158.7 | 125.4 | 4.34 | 3.43 |
| 9 | 59,362 | 206 | 3,543 | 154.1 | 120.6 | 4.37 | 3.41 |
| 10+ | 70,826 | 201 | 3,311 | 142.7 | 111.9 | 4.33 | 3.39 |
| Total | 1,403,287 | 210 | 3,452 | 148.8 | 117.4 | 4.34 | 3.41 |

Jersey

| *Age* | *Number* | *Days in milk* | *Milk (litres)* | *Milkfat (kg)* | *Protein (kg)* | *Milkfat %* | *Protein %* |
|---|---|---|---|---|---|---|---|
| 2 | 76,456 | 214 | 2,140 | 117.5 | 82.9 | 5.50 | 3.87 |
| 3 | 67,161 | 214 | 2,417 | 136.5 | 96.7 | 5.67 | 4.01 |
| 4 | 62,770 | 215 | 2,680 | 150.9 | 107.3 | 5.64 | 4.01 |
| 5 | 53,080 | 216 | 2,749 | 156.7 | 110.2 | 5.71 | 4.02 |
| 6 | 41,265 | 215 | 2,771 | 156.8 | 110.9 | 5.67 | 4.01 |
| 7 | 34,387 | 213 | 2,713 | 156.2 | 109.5 | 5.77 | 4.05 |
| 8 | 26,717 | 211 | 2,637 | 152.9 | 107.2 | 5.81 | 4.07 |
| 9 | 18,546 | 209 | 2,570 | 148.2 | 104.0 | 5.78 | 4.06 |
| 10+ | 23,298 | 204 | 2,486 | 136.9 | 98.4 | 5.52 | 3.97 |
| Total | 403,680 | 214 | 2,536 | 143.2 | 101.2 | 5.65 | 3.99 |

Holstein-Friesian X Jersey crossbred (1st-2nd cross)

| Age | Number | Days in milk | Milk (litres) | Milkfat (kg) | Protein (kg) | Milkfat % | Protein % |
|---|---|---|---|---|---|---|---|
| 2 | 157,564 | 212 | 2,713 | 125.8 | 94.8 | 4.67 | 3.50 |
| 3 | 130,693 | 213 | 3,087 | 146.3 | 111.1 | 4.78 | 3.61 |
| 4 | 116,612 | 213 | 3,402 | 160.4 | 122.1 | 4.75 | 3.60 |
| 5 | 90,392 | 214 | 3,588 | 167.9 | 127.9 | 4.72 | 3.58 |
| 6 | 69,305 | 214 | 3,594 | 168.6 | 129.1 | 4.73 | 3.61 |
| 7 | 57,752 | 212 | 3,524 | 167.2 | 127.3 | 4.78 | 3.63 |
| 8 | 41,301 | 210 | 3,424 | 163.1 | 123.7 | 4.80 | 3.63 |
| 9 | 29,333 | 208 | 3,315 | 157.7 | 118.9 | 4.79 | 3.60 |
| 10+ | 33,402 | 202 | 3,106 | 145.6 | 110.2 | 4.71 | 3.56 |
| Total | 726,354 | 212 | 3,231 | 152.0 | 115.4 | 4.74 | 3.58 |

Ayrshire

| Age | Number | Days in milk | Milk (litres) | Milkfat (kg) | Protein (kg) | Milkfat % | Protein % |
|---|---|---|---|---|---|---|---|
| 2 | 5,849 | 216 | 2,570 | 112.5 | 89.4 | 4.39 | 3.48 |
| 3 | 5,195 | 214 | 2,946 | 127.7 | 103.5 | 4.35 | 3.51 |
| 4 | 4,632 | 211 | 3,262 | 139.4 | 114.3 | 4.29 | 3.50 |
| 5 | 4,097 | 212 | 3,355 | 144.3 | 117.5 | 4.31 | 3.50 |
| 6 | 3,279 | 212 | 3,420 | 147.2 | 120.1 | 4.32 | 3.51 |
| 7 | 2,628 | 211 | 3,469 | 147.5 | 121.4 | 4.26 | 3.50 |
| 8 | 1,911 | 211 | 3,375 | 144.3 | 118.1 | 4.28 | 3.50 |
| 9 | 1,344 | 208 | 3,221 | 138.7 | 112.8 | 4.30 | 3.50 |
| 10+ | 1,935 | 205 | 3,123 | 132.8 | 108.9 | 4.25 | 3.48 |
| Total | 30,870 | 212 | 3,121 | 134.4 | 109.2 | 4.32 | 3.50 |

## *Table 4.7:* Liveweight by age and breed of cow for 1998/99

| | Holstein Friesian | | Jersey | | Hol Friesian X Jersey | | 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 | 407 | 17,039 | 316 | 5,316 | 384 | 11,103 | 370 | 284 |
| 3 | 454 | 4,673 | 355 | 1,608 | 426 | 3,617 | 405 | 45 |
| 4 | 483 | 3,602 | 371 | 1,401 | 451 | 2,898 | 423 | 26 |
| 5 | 500 | 2,784 | 383 | 1,157 | 469 | 2,266 | 435 | 35 |
| 6 | 515 | 2,295 | 387 | 850 | 482 | 1,700 | 452 | 25 |
| 7 | 516 | 1,922 | 393 | 638 | 483 | 1,308 | 462 | 21 |
| 8 | 512 | 1,269 | 392 | 498 | 480 | 875 | 476 | 11 |
| 9 | 512 | 923 | 392 | 338 | 480 | 629 | 462 | 6 |
| 10+ | 505 | 919 | 406 | 426 | 479 | 677 | 453 | 11 |
| Total | 450 | 35,426 | 351 | 12,232 | 426 | 25,073 | 395 | 464 |

# C. Artificial Breeding Statistics

- ***Minimal decrease in total cows to AB for 1998/99***
- ***Inseminations per cow increase from 1997/98***

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 showed a minimal decrease of 0.1%. A decline in the number of yearlings to AB can be seen since 1996/97.

### *Table 4.8:* Trends in Artificial Breeding (AB) use since 1990/91 by region: cows and yearlings to AB

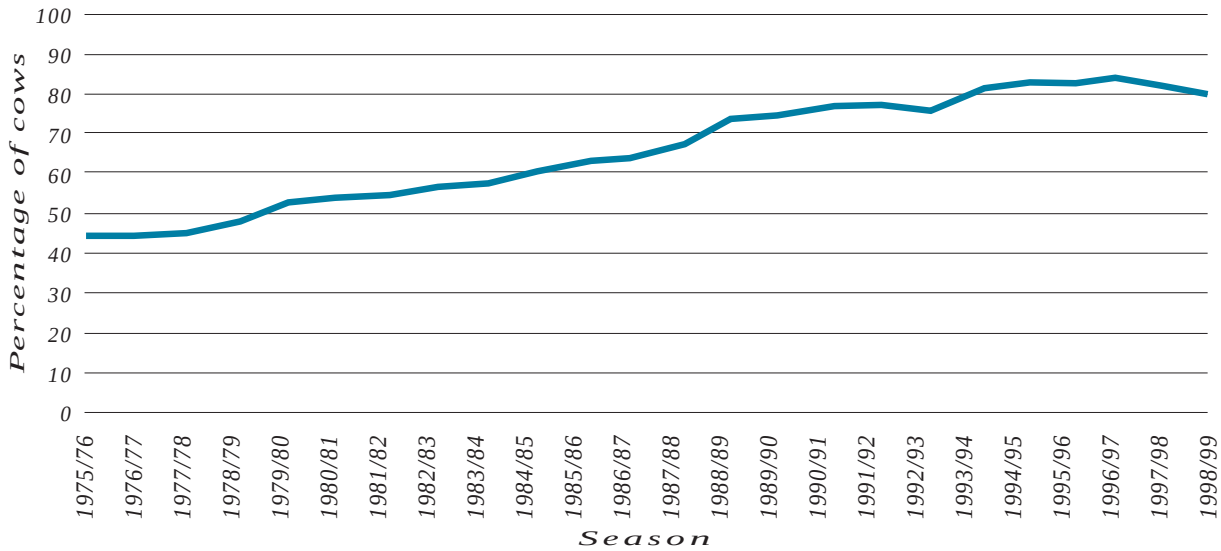
Cows to AB

| *Livestock Improvement Region* | *1990/91* | *1991/92* | *1992/93* | *1993/94* | *1994/95* | *1995/96* | *1996/97* | *1997/98* | *1998/99* |
|---|---|---|---|---|---|---|---|---|---|
| Northland | 229,246 | 224,597 | 216,772 | 249,293 | 253,662 | 257,557 | 262,429 | 258,057 | 244,115 |
| Auckland | 830,117 | 841,397 | 886,199 | 960,928 | 992,301 | 1,007,497 | 1,065,624 | 1,069,038 | 1,066,442 |
| B.O.P. / East Coast | 128,405 | 131,478 | 134,648 | 147,388 | 151,469 | 152,836 | 155,267 | 156,602 | 153,294 |
| Taranaki | 345,591 | 350,946 | 361,864 | 388,152 | 398,201 | 398,571 | 399,435 | 404,930 | 395,636 |
| Wellington / Hawkes Bay | 163,439 | 164,950 | 174,192 | 204,054 | 220,471 | 230,582 | 254,002 | 266,514 | 266,171 |
| South Island | 162,168 | 181,003 | 206,475 | 266,201 | 319,949 | 371,210 | 437,078 | 483,968 | 510,514 |
| New Zealand | 1,858,966 | 1,894,371 | 1,980,150 | 2,216,016 | 2,336,053 | 2,418,253 | 2,573,835 | 2,639,109 | 2,636,172 |

Yearlings to AB

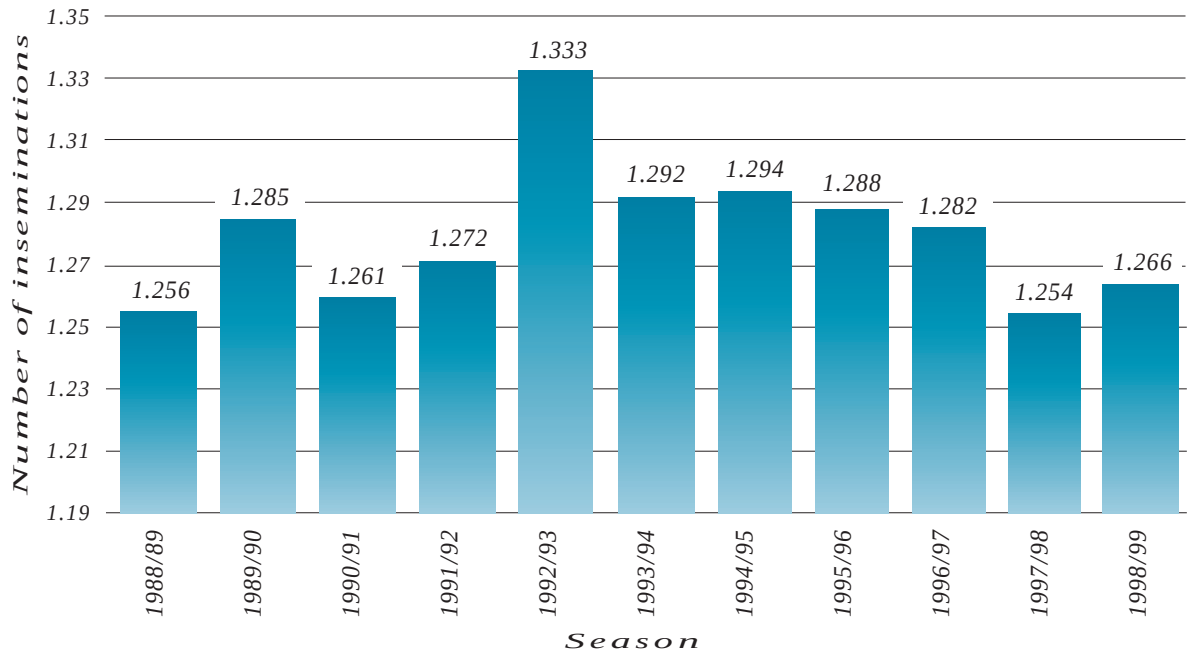
| *Livestock Improvement Region* | *1990/91* | *1991/92* | *1992/93* | *1993/94* | *1994/95* | *1995/96* | *1996/97* | *1997/98* | *1998/99* |
|---|---|---|---|---|---|---|---|---|---|
| Northland | 14,219 | 13,071 | 14,475 | 19,555 | 21,159 | 22,034 | 20,613 | 15,966 | 11,188 |
| Auckland | 28,861 | 24,921 | 32,608 | 42,856 | 54,867 | 53,038 | 48,291 | 31,102 | 25,968 |
| B.O.P. / East Coast | 7,035 | 6,996 | 8,582 | 13,286 | 16,773 | 17,501 | 15,753 | 10,317 | 7,854 |
| Taranaki | 11,056 | 9,884 | 11,989 | 15,740 | 19,099 | 17,864 | 11,909 | 8,428 | 5,748 |
| Wellington / Hawkes Bay | 5,822 | 5,118 | 5,534 | 10,882 | 13,473 | 15,321 | 14,375 | 9,887 | 6,223 |
| South Island | 7,488 | 10,033 | 16,011 | 32,382 | 44,715 | 48,194 | 54,152 | 35,159 | 34,906 |
| New Zealand | 74,481 | 70,023 | 89,199 | 134,701 | 170,086 | 173,952 | 165,093 | 110,859 | 91,887 |

### *Graph 4.3:* Trend in the percentage of cows to Artificial Breeding (AB) since 1975/76



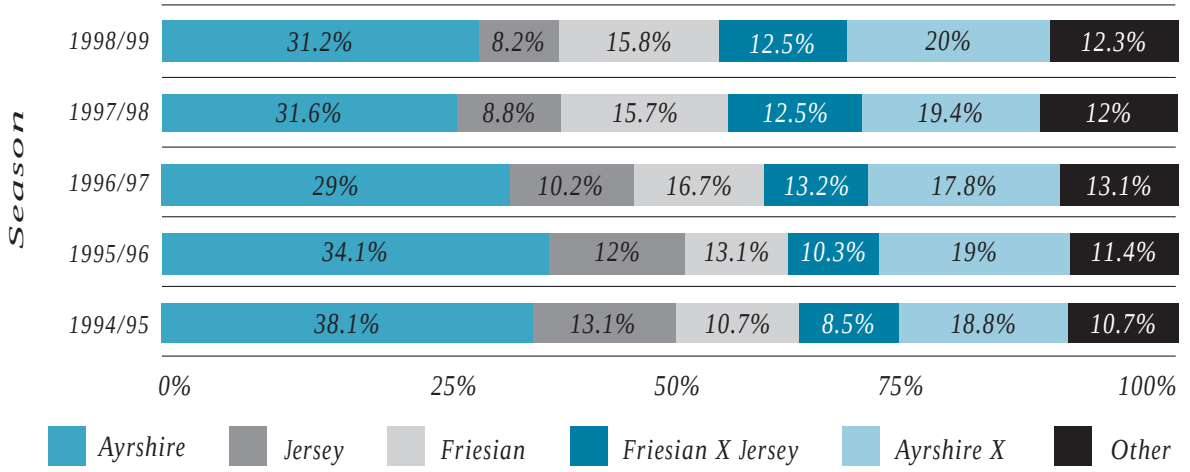
Since the 1988/89 season, the average number of inseminations per cow as recorded on the Livestock Improvement National Database has ranged between 1.25 and 1.33 inseminations (Graph 4.4). In 1998/99 the average number of inseminations per cow increased by 1% from the previous year to 1.27.

### Graph 4.4: Average number of inseminations per cow since 1988/89

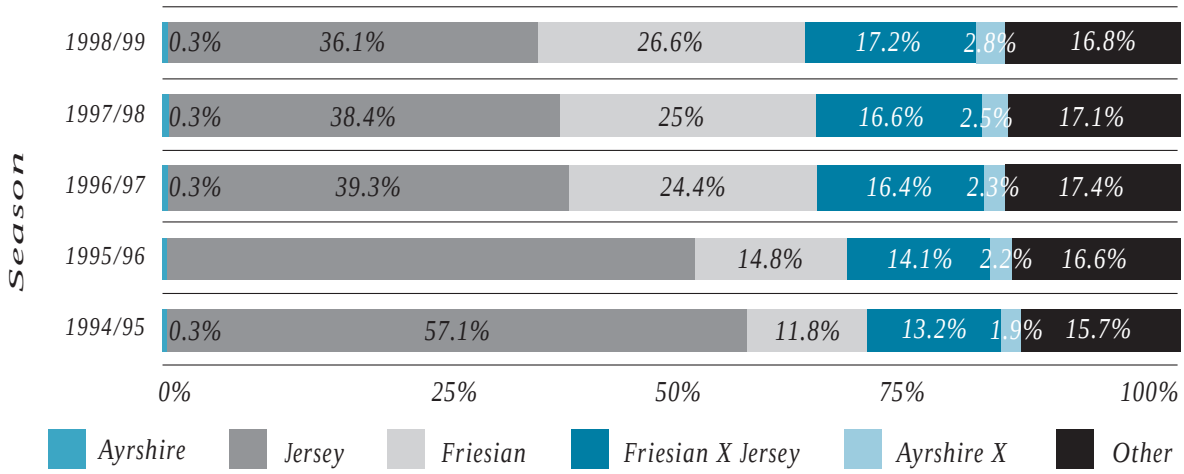



The use of Ayrshire, Holstein-Friesian and Jersey semen over different cow breeds for the seasons 1994/95 to 1998/99 is shown below. Ayrshire semen use over all other breeds remained similar to the previous season (Graph 4.5). The use of Jersey semen over Holstein-Friesian cows has shown a continued increase (Graph 4.6). The use of Holstein-Friesian semen over Holstein-Friesian cows has seen little change since 1994/95 (Graph 4.7).

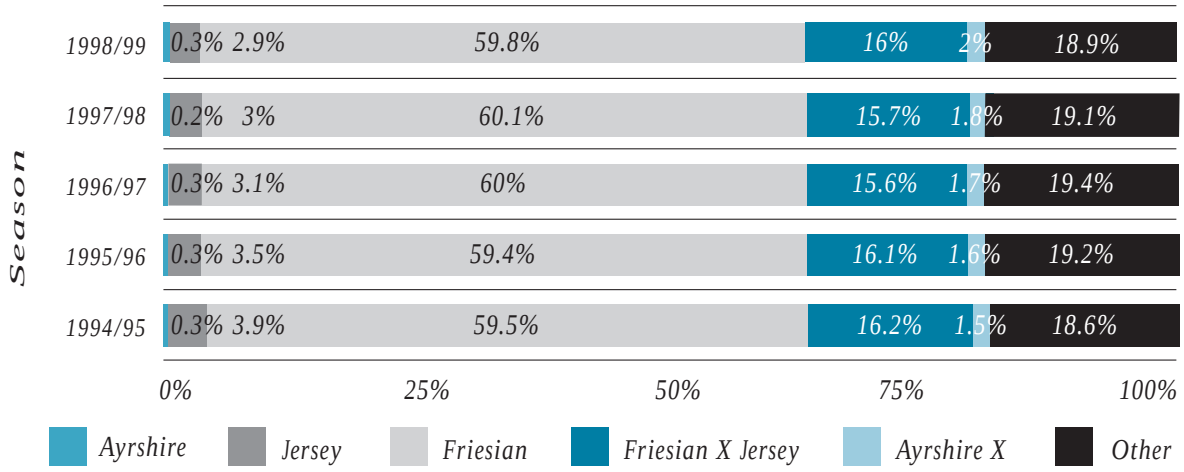
### Graph 4.5: Ayrshire semen usage by cow breed since 1994/95



### Graph 4.6: Jersey semen usage by cow breed since 1994/95

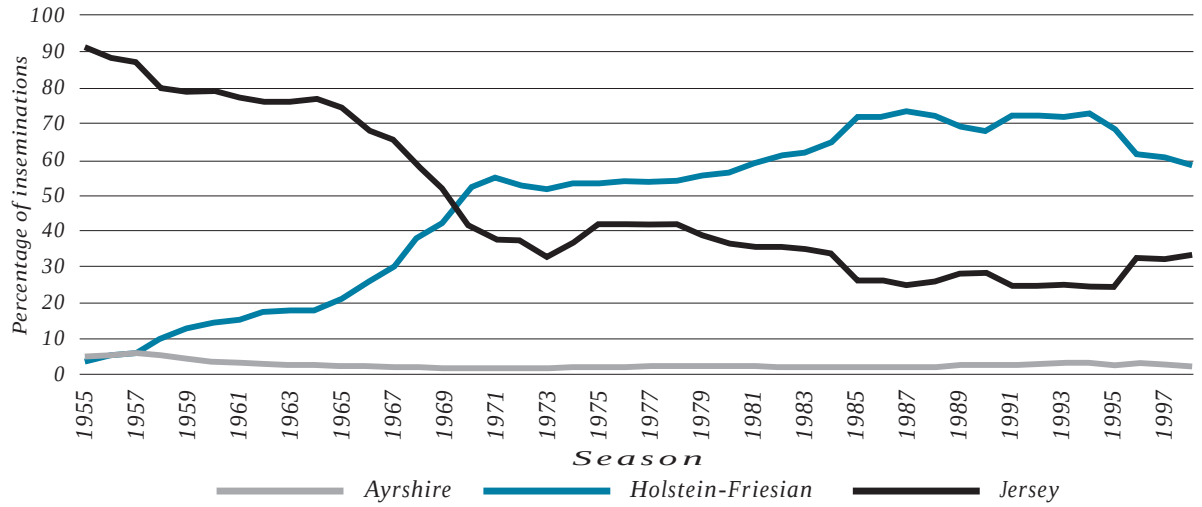



### Graph 4.7: Holstein-Friesian semen usage by cow breed since 1994/95




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 breed has declined slightly in use for the 1998/99 season, while the Jersey breed has increased by 1.6 %.

### Graph 4.8: Trend in the percentage of inseminations of each major breed since 1955



# D. Animal Evaluation

The genetic merit of New Zealand dairy cows and sires is estimated using statistical methods that allow simultaneous evaluation of cows and sires of all breeds, using all recorded relationships. The structure of the national herd reveals large numbers of crossbred cows, and large numbers of herds with mixed breeds. For this reason the national animal 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 Value*), lifetime productive ability (*Production Value*) and current season productive ability (*Lactation Value*) for individual traits, including milkfat, protein, volume, liveweight, and survival.
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 | + |
| | | Survival 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, i.e. 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 1998/99 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 27 February 1999

| | *Milkfat ($/kg)* | *Protein ($/kg)* | *Milk ($/kg)* | *Liveweight ($/kg)* | *Survival ($/% change)* |
|---|---|---|---|---|---|
| Breeding Worth | 0.80 | 3.35 | –0.047 | –0.43 | 0.91 |
| Production Worth | 1.17 | 4.21 | –0.061 | –0.58 | – |
| Lactation Worth | 1.94 | 4.82 | –0.076 | –0.70 | – |

The information for all animal evaluation statistics was sourced from animals recorded on the Livestock Improvement National Database at 15 May 1999.

Table 4.10 shows the Breeding Values (BV) and BW by breed, of all bulls born in 1994, first proven in the 1998/99 season with a reliability of 75% or greater.

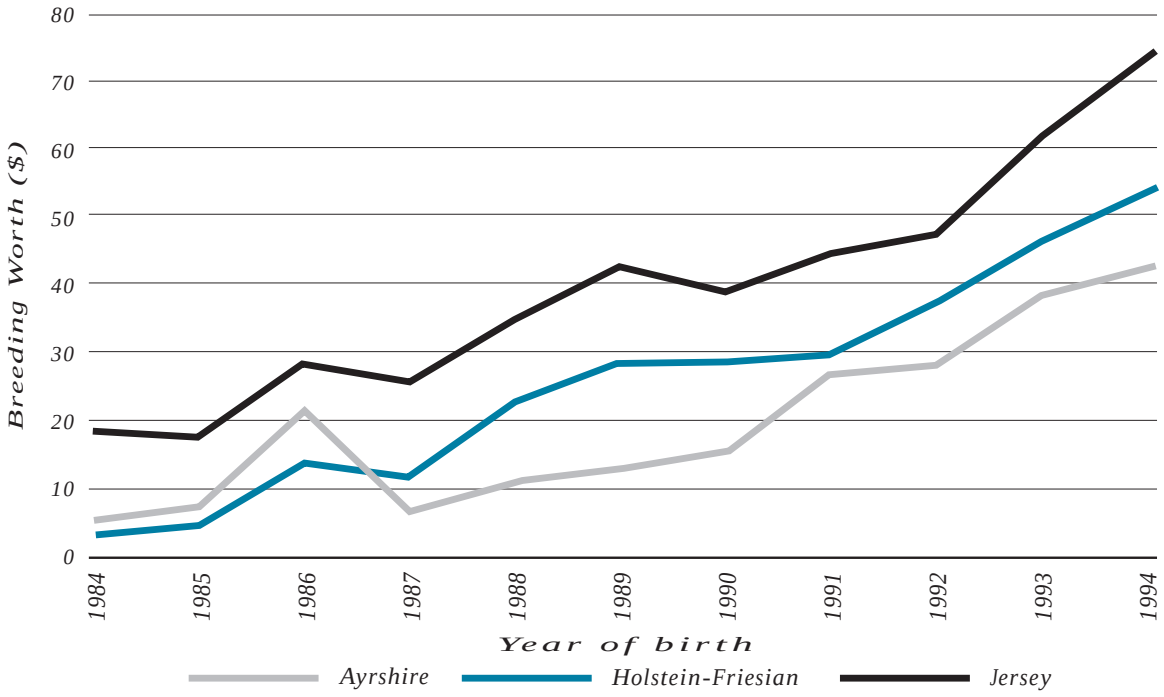
### *Table 4.10:* Average Breeding Values and Breeding Worth of 1994 born bulls first proven in 1998/99 season (reliability of 75% or greater)

| *Breed* | *Fat BV* | *Protein BV* | *Milk Vol BV* | *Liveweight BV* | *Survival BV* | *BW>75% Rel* | *Number of Sires* |
|---|---|---|---|---|---|---|---|
| Ayrshire | 12.5 | 21.2 | 704 | 13.9 | –0.15 | 41.9 | 6 |
| Holstein-Friesian | 31.8 | 36.3 | 1237 | 81.3 | 0.04 | 54.1 | 195 |
| Jersey | 20.1 | 13.3 | 106 | –40.2 | 0.79 | 73.6 | 96 |

*(Evaluation date 15 May 1999)*

The genetic trend of proven dairy bulls is shown in Graph 4.9. Bulls born in 1994 are first proven in the 1998/99 season.

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




*(Evaluation date: 15 May 1999)*

Young bulls are initially selected for Artificial Breeding (AB) use 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 the best progeny tested bulls are returned to service for use as proven sires.

Table 4.11 shows the number of sires with BW (estimated with reliability of 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.

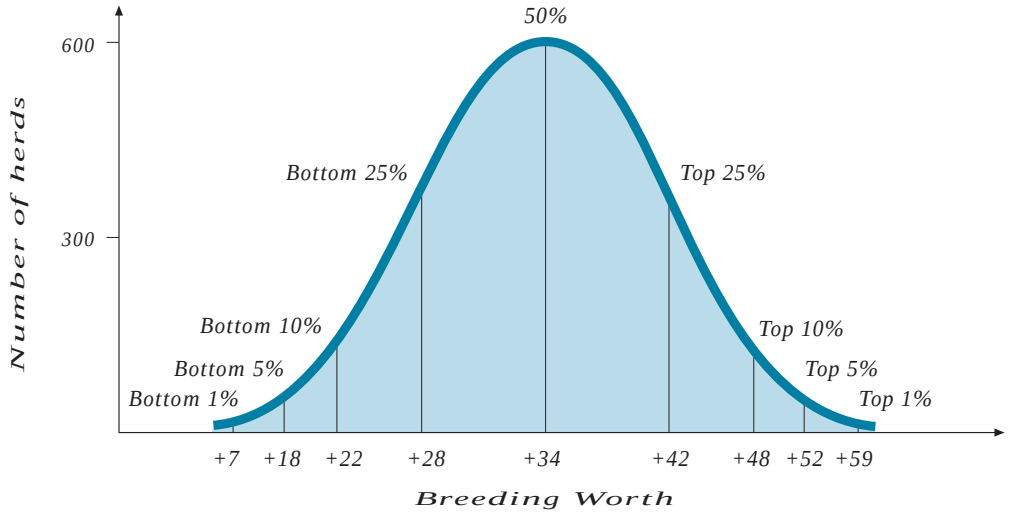
### Table 4.11: Number of sires obtaining Breeding Worth (BW) by birth year and breed (reliability of 75% or greater, includes overseas bulls)

| Year of birth | Number of sires | Holstein-Friesian | Jersey | Ayrshire | Other breeds |
|---|---|---|---|---|---|
| 1984 | 315 | 182 | 94 | 31 | 8 |
| 1985 | 311 | 182 | 93 | 22 | 14 |
| 1986 | 287 | 177 | 82 | 22 | 6 |
| 1987 | 316 | 191 | 95 | 18 | 12 |
| 1988 | 317 | 193 | 95 | 22 | 7 |
| 1989 | 353 | 203 | 115 | 19 | 16 |
| 1990 | 316 | 186 | 97 | 24 | 9 |
| 1991 | 331 | 204 | 96 | 24 | 7 |
| 1992 | 333 | 208 | 102 | 17 | 6 |
| 1993 | 305 | 180 | 102 | 21 | 2 |
| 1994 | 298 | 195 | 96 | 6 | 1 |

*(Evaluation date 15 May 1999)*

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 1998/99 season. For example, Graph 4.10 shows 50% of New Zealand herds have a BW of 34 or greater and 25% of New Zealand herds have a BW of 42 or greater.

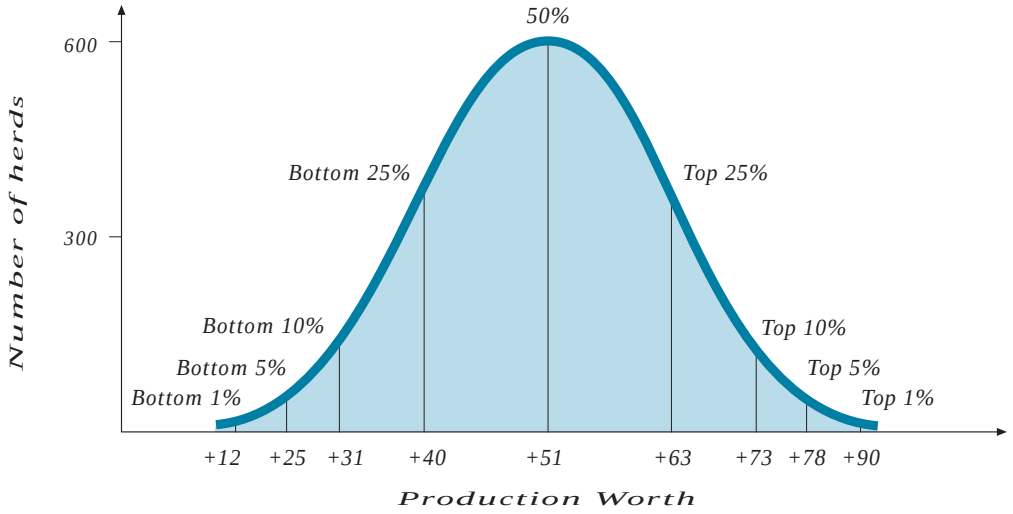
### Graph 4.10: Distribution of herd Breeding Worth (BW) in 1998/99




*(Evaluation date: 15 May 1999)*

The distribution graph for PW for herds in the 1998/99 season is based on all cows recorded with a test number in herds signed up for herd testing for 1998/99. Graph 4.11 shows that 50% of New Zealand herds have a PW of 51 or greater, and that 25% of New Zealand herds have a PW of 63 or greater.

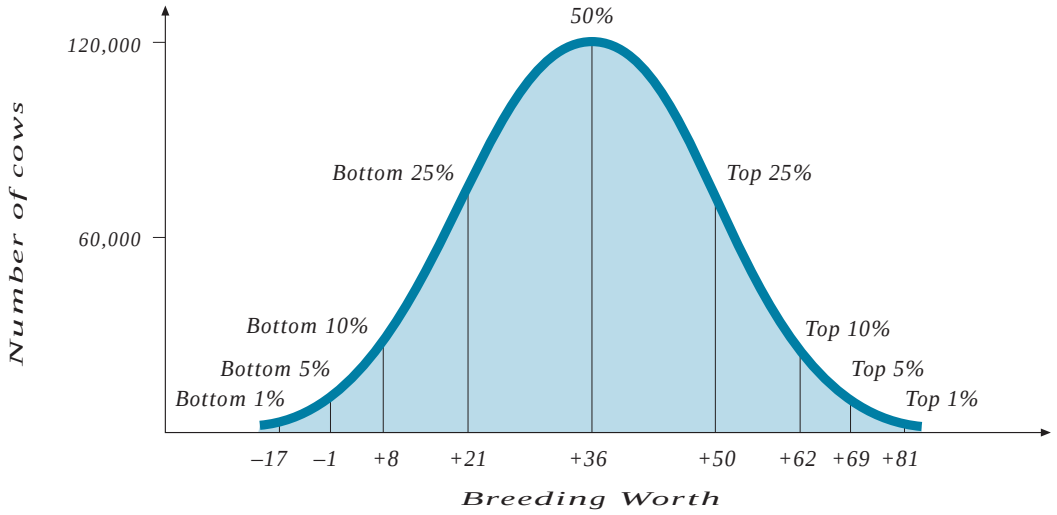
### Graph 4.11: Distribution of herd Production Worth (PW) in 1998/99




*(Evaluation date: 15 May 1999)*

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 1998/99 season. Graph 4.12 shows that 50% of New Zealand cows have a BW of 36 or above and that 25% of New Zealand cows have a BW of 50 or above.

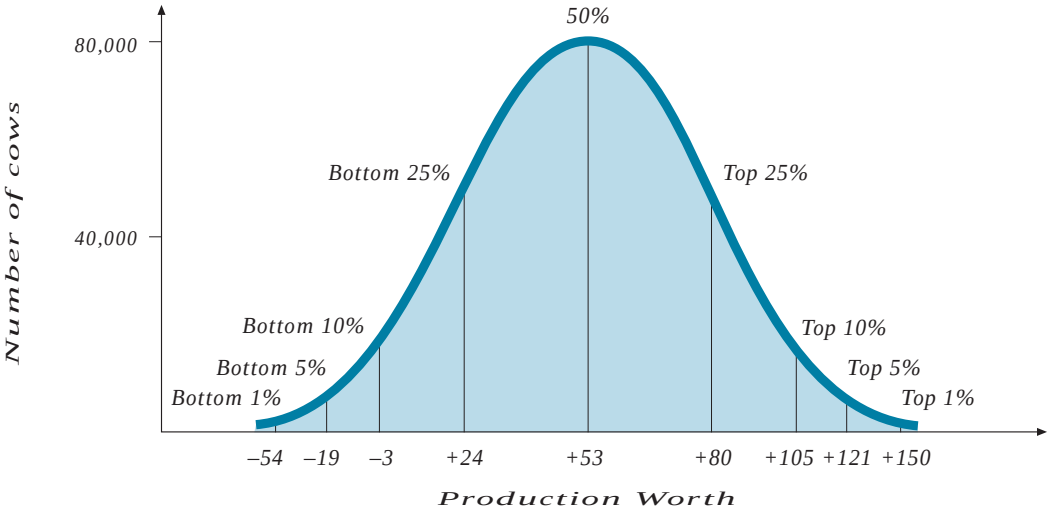
### Graph 4.12: Distribution of cow Breeding Worth (BW) in 1998/99




*(Evaluation date: 15 May 1999)*

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 1998/99 season. Graph 4.13 shows that 50% of New Zealand cows have a PW of 53 or above and a quarter have a PW of 80 or above.

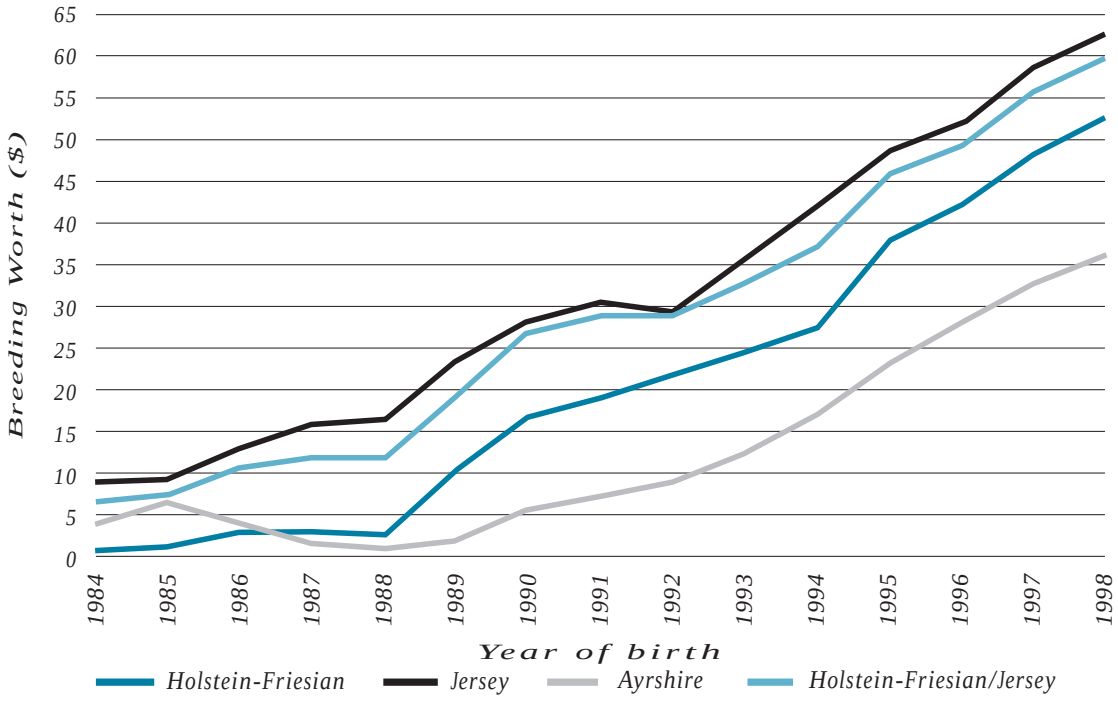
### Graph 4.13: Distribution of cow Production Worth (PW) in 1998/99




*(Evaluation date: 15 May 1999)*

The genetic trend for cows is based on all cows recorded on the Livestock Improvement National Database up to the 1998/99 season. Also included are the estimated BW and PW for replacement stock (1997 and 1998 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.

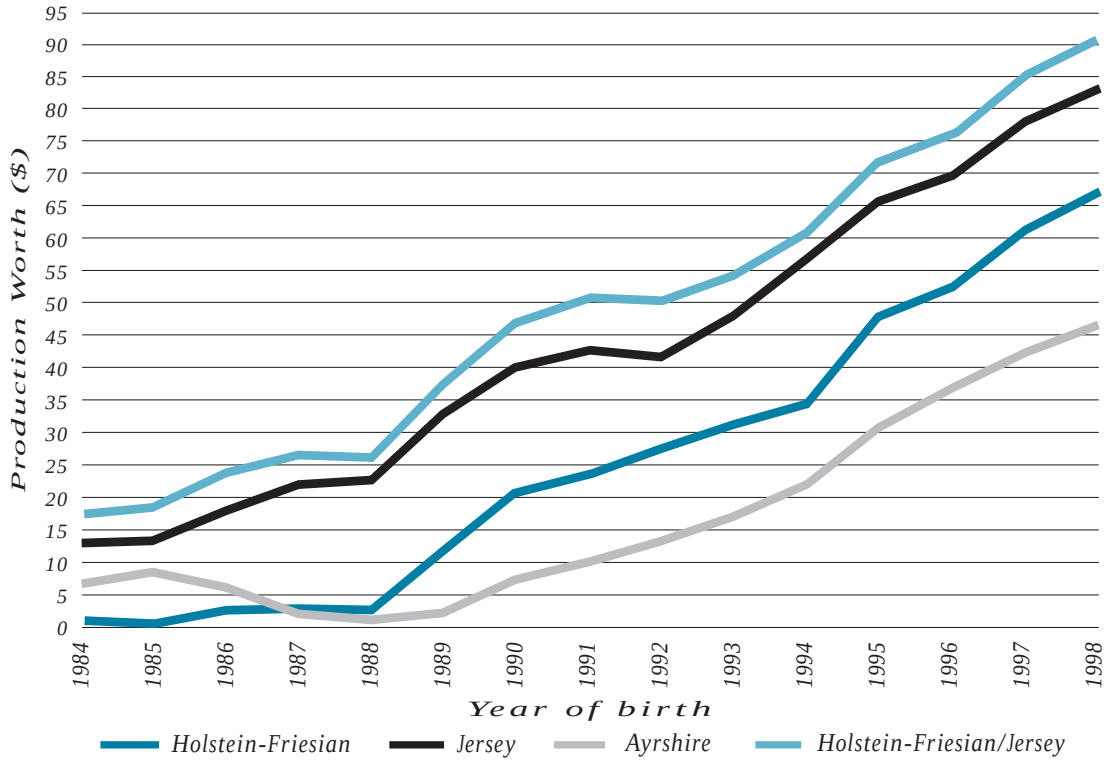
### Graph 4.14: Genetic trend in Breeding Worth (BW) for all cows in 1998/99




*(Evaluation date: 15 May 1999)*

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

### Graph 4.15: Trend in Production Worth (PW) for all cows in 1998/99




*(Evaluation date: 15 May 1999)*

Table 4.12 shows the average BVs and BW by breed, of all 1996 born cows. The Jersey breed has the highest BW at 52.1. 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 1996

| Breed | BW $ | Fat BV (kg) | Protein BV (kg) | Milk Vol BV (l) | Liveweight BV (kg) | Survival BV (%) | Cow numbers |
|---|---|---|---|---|---|---|---|
| Holstein-Friesian | 43.3 | 26.7 | 25.5 | 850 | 55.7 | 0.4 | 460,773 |
| Jersey | 52.1 | 12.9 | 5.3 | –97 | –45.1 | 0.3 | 118,534 |
| Ayrshire | 27.8 | 8.4 | 13.1 | 430 | 5.3 | –0.3 | 10,701 |
| Hol-Fr X Jersey | 49.8 | 21.7 | 17.0 | 432 | 10.2 | 0.4 | 148,163 |
| Guernsey | –7.2 | –2.4 | 2.0 | 36 | 17.8 | –2.8 | 203 |
| Milking Shorthorn | –7.0 | –5.1 | 3.4 | 97 | 18.7 | –1.9 | 1,313 |
| Brown Swiss | –21.7 | –9.6 | 3.7 | 106 | 43.8 | –3.1 | 171 |
| Other | 34.3 | 14.8 | 14.7 | 432 | 14.0 | –0.1 | 25,295 |
| Weighted average | 45.2 | 22.8 | 20.1 | 600 | 29.1 | 0.3 | |

*Evaluation date 15 May 1999*

Survivability is measured by the percentage of cows that have lactations recorded for consecutive years. The 1998/99 season 2-3 years figure is the percentage of cows that were milking as 2-year-olds in 1997/98 season and are now milking as 3-year-olds in the 1998/99 season. Table 4.13 shows that for the 1998/99 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 | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2-3 years | 3-4 years | 4-5 years | 5-6 years | 6-7 years | 7-8 years | 8-9 years |
| 1996/97 | 83.8 | 84.3 | 84.0 | 80.9 | 77.6 | 73.7 | 68.5 |
| 1997/98 | 84.8 | 85.8 | 84.8 | 81.1 | 77.0 | 73.2 | 67.8 |
| 1998/99 | 83.6 | 85.4 | 85.1 | 82.4 | 79.5 | 75.1 | 70.1 |

# 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 on the 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 December 1993.

### 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 | 5.69 |
| 1974/75 | 0.78 | 0.75 | 5.60 |
| 1975/76 | 0.81 | 0.83 | 5.40 |
| 1976/77 | 0.88 | 0.87 | 4.85 |
| 1977/78 | 0.96 | 0.98 | 4.77 |
| 1978/79 | 0.99 | 1.03 | 4.45 |
| 1979/80 | 1.20 | 1.22 | 4.71 |
| 1980/81 | 1.52 | 1.52 | 4.95 |
| 1981/82 | 1.91 | 1.95 | 5.53 |
| 1982/83 | 2.07 | 2.11 | 5.10 |
| 1983/84 | 2.01 | 2.09 | 4.68 |
| 1984/85 | 2.28 | 2.33 | 4.98 |
| 1985/86 | 2.30 | 2.29 | 4.19 |
| 1986/87 | 1.90 | 2.03 | 3.38 |
| 1987/88 | 2.07 | 2.34 | 3.26 |
| 1988/89 | 3.05 | 3.28 | 4.29 |
| 1989/90 | 3.33 | 3.59 | 4.51 |
| 1990/91 | 2.12 | 2.42 | 2.82 |
| 1991/92 | 2.98 | 3.34 | 3.79 |
| 1992/93 | 3.25 | 3.66 | 4.11 |
| 1993/94 | 2.90 | 3.32 | 3.68 |
| 1994/95 | 3.00 | 3.40 | 3.73 |
| 1995/96 | 3.60 | 3.99 | 4.19 |
| 1996/97 | 3.18 | 3.63 | 3.73 |
| 1997/98 | 3.00 | 3.42 | 3.48 |
| 1998/99 | 3.25 | 3.58 | 3.58 |

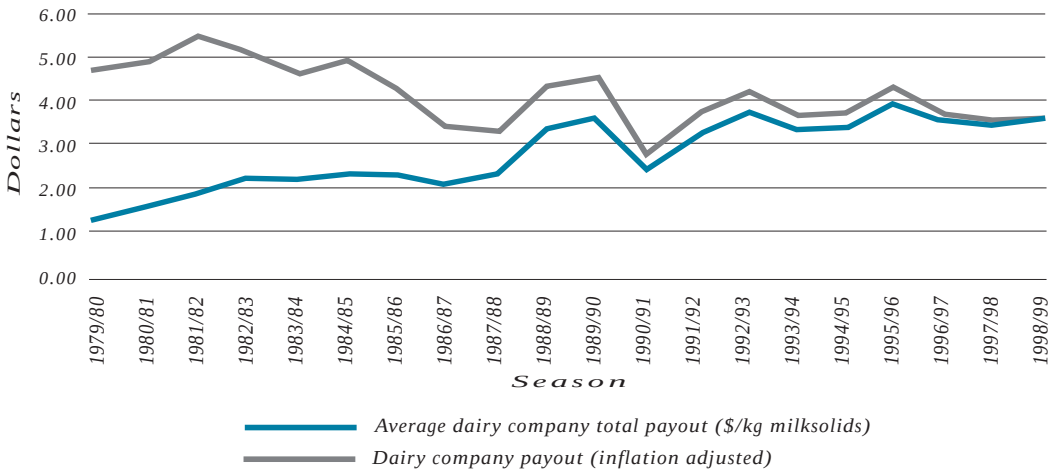
– *not available*

* *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*

- **2.9% increase for inflation adjusted dairy company payout**

**Graph 5.1: Trend in milksolids payout to dairy farmers since 1979/80**




## ii) Dairy farm land sale values

- **Less farms sold annually since 1992**

From 1992 there has been a decrease in the numbers of dairy farms sold in the year. 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**

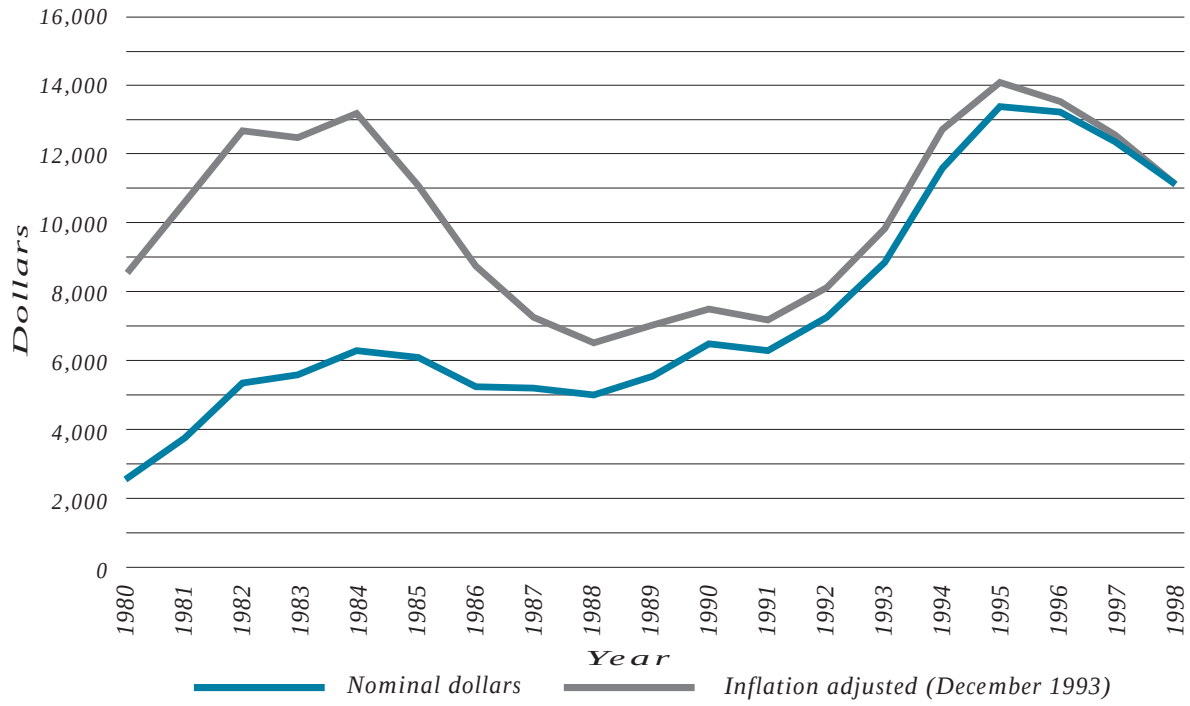
| Year | Number of farms | Average sale price | Inflation adjusted average sale price ** | Average hectares | Price per hectare | Inflation adjusted average price per hectare** | Price per kg milkfat | Price per kg milksolids* |
|---|---|---|---|---|---|---|---|---|
| 1978 | 983 | 95,743 | 414,336 | 46 | 2,070 | 8,958 | 8.6 | 4.9 |
| 1979 | 1,245 | 122,661 | 471,845 | 50 | 2,436 | 9,371 | 9.7 | 5.6 |
| 1980 | 1,256 | 146,065 | 476,134 | 55 | 2,650 | 8,638 | 11.2 | 6.4 |
| 1981 | 1,327 | 208,246 | 590,619 | 55 | 3,783 | 10,729 | 14.8 | 8.5 |
| 1982 | 813 | 276,042 | 667,822 | 52 | 5,309 | 12,844 | 21.3 | 12.2 |
| 1983 | 527 | 257,373 | 575,507 | 46 | 5,587 | 12,493 | 20.4 | 11.7 |
| 1984 | 618 | 301,076 | 643,150 | 49 | 6,189 | 13,221 | 21.9 | 12.6 |
| 1985 | 505 | 298,746 | 547,338 | 49 | 6,044 | 11,073 | 21.0 | 12.1 |
| 1986 | 274 | 251,165 | 416,809 | 47 | 5,298 | 8,792 | 18.4 | 10.6 |
| 1987 | 504 | 270,180 | 376,751 | 52 | 5,212 | 7,268 | 16.8 | 9.7 |
| 1988 | 576 | 278,650 | 365,228 | 56 | 5,013 | 6,571 | 16.0 | 9.2 |
| 1989 | 1,013 | 325,847 | 408,938 | 59 | 5,561 | 6,979 | 17.8 | 10.2 |
| 1990 | 868 | 373,553 | 435,595 | 58 | 6,467 | 7,541 | 21.8 | 12.5 |
| 1991 | 538 | 362,819 | 411,605 | 58 | 6,283 | 7,128 | 21.7 | 12.5 |
| 1992 | 897 | 446,979 | 501,976 | 62 | 7,183 | 8,067 | 23.1 | 13.3 |
| 1993 | 834 | 543,984 | 603,492 | 61 | 8,903 | 9,877 | 31.0 | 17.8 |
| 1994 | 784 | 704,245 | 772,745 | 61 | 11,640 | 12,772 | 37.5 | 21.6 |
| 1995 | 672 | 775,110 | 813,177 | 58 | 13,400 | 14,058 | 41.9 | 24.1 |
| 1996 | 784 | 785,510 | 808,045 | 60 | 13,187 | 13,565 | 41.6# | 23.9 |
| 1997 | 520 | 674,809 | 686,432 | 54 | 12,388 | 12,601 | 38.5# | 22.1 |
| 1998 | 496 | 704,309 | 704,309 | 64 | 11,076 | 11,076 | 32.0# | 18.4 |

*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 kg 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, both in 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, except for 1999 (half year to June).

**Graph 5.2: Trend in dairy land values (price per hectare) since 1980**



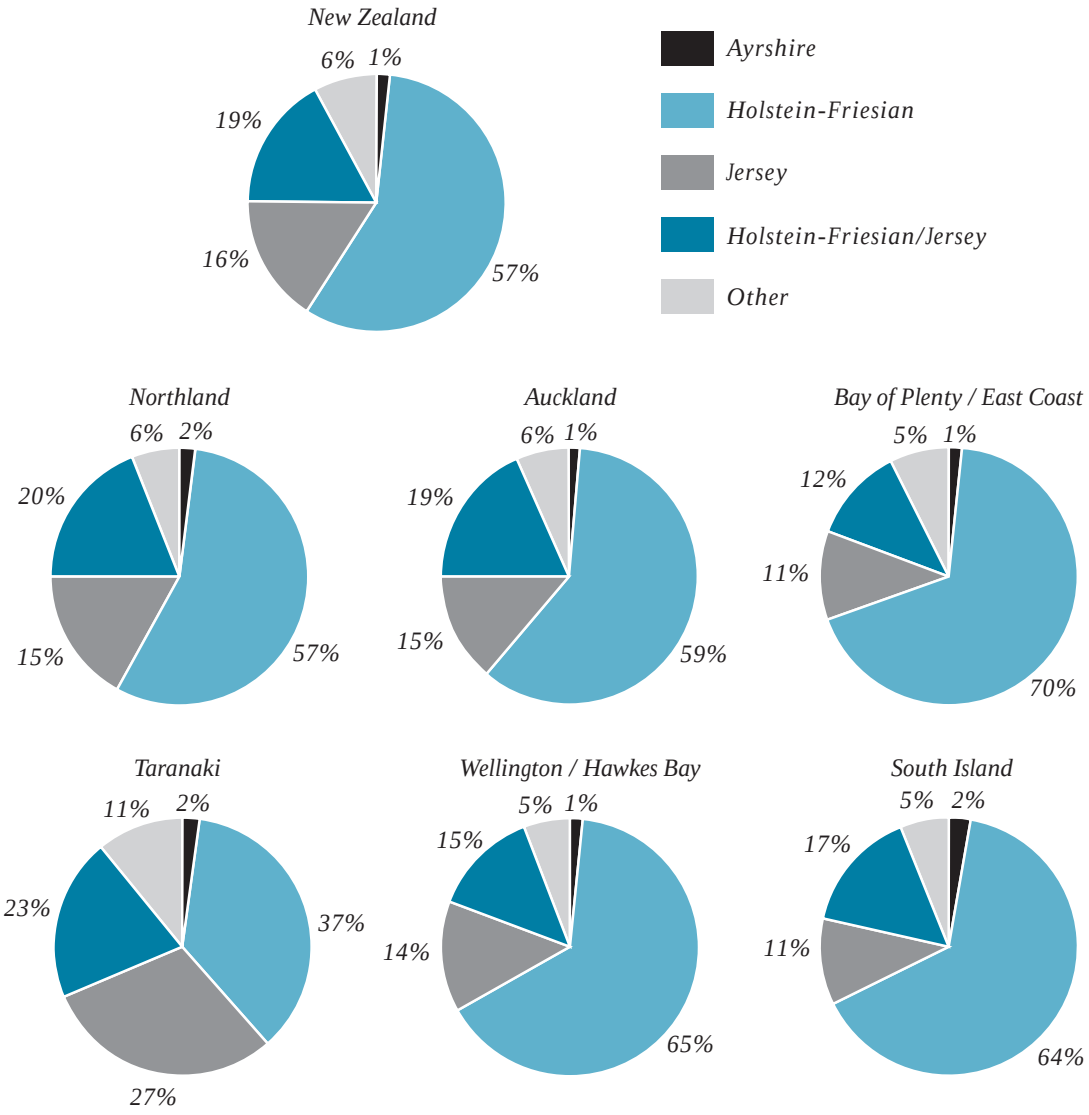
## B. Breed breakdown

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 crossbred and Ayrshire cows with the remaining breeds grouped into Other. Bay of Plenty/East Coast region has the highest percentage of Holstein-Friesian cows, whereas Taranaki has the highest proportion of Jersey cows.

***Graph 5.3:*** **Breed percentages of cows in each region in 1998/99**



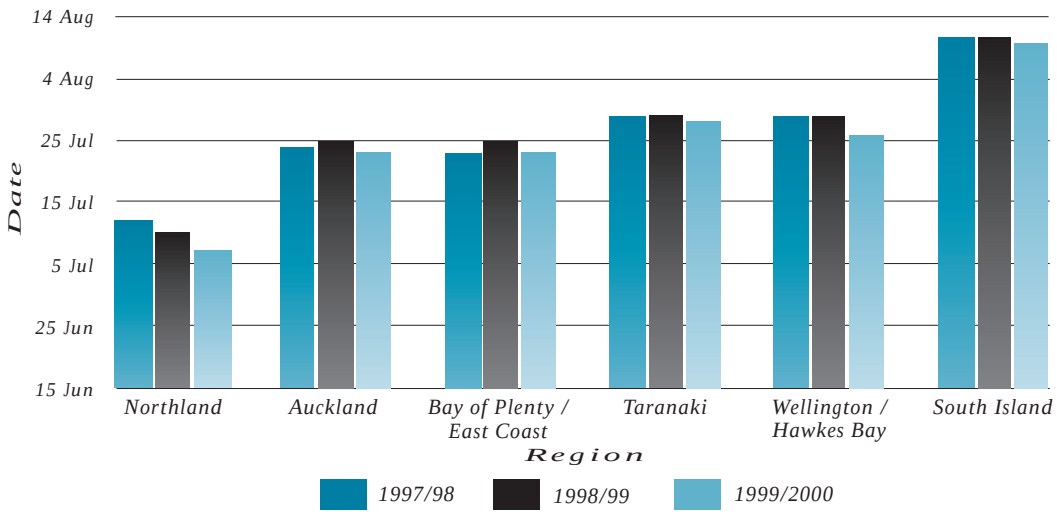
# C. Median calving and planned start of calving dates

The trend in calving dates within and between regions is best shown by the "planned start of calving". This is the date 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 which have matings or calvings recorded for at least 50% of their recorded animals are included in this analysis.

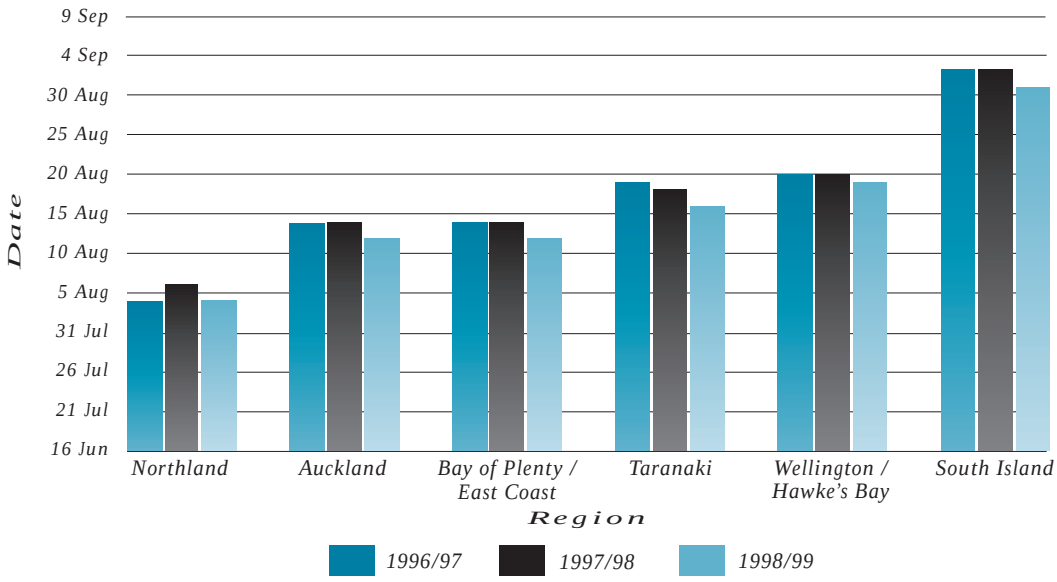
The forecast planned start of calving dates for mature cows for the 1999/2000 season compared to the dates previously forecast for 1997/98 and 1998/99 seasons are shown in Graph 5.4.

**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 1996/97, 1997/98 and 1998/99 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. Common levels of variable order sharemilking agreements are 29% and 39%.

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 1998/99, 1.1% 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, equal stocking rates.

Agreements other than the common 29%, 39% and 50% agreements are shown as combined groups in Table 5.3. In 1998/99, 36.2% of New Zealand dairy farms were being operated under a sharemilking agreement.

### Table 5.3: 1998/99 Herd analysis by operating structure

| Operating structure | Number of herds | Average herd size | Average effective hectares | Average cows per effective hectare |
|---|---|---|---|---|
| Owner-operators | 9,005 | 213 | 85 | 2.7 |
| Contract milkers | 154 | 273 | 109 | 2.7 |
| Sharemilkers: | | | | |
| Less than 20% | 158 | 299 | 115 | 2.7 |
| 20-28% | 1,086 | 257 | 101 | 2.7 |
| 29% | 114 | 211 | 88 | 2.5 |
| 30-38% | 286 | 244 | 99 | 2.6 |
| 39% | 76 | 189 | 80 | 2.5 |
| 40-44% | 80 | 219 | 93 | 2.6 |
| 50/50 (45-55%) | 3,403 | 257 | 101 | 2.7 |
| All sharemilkers | 5,203 | 255 | 100 | 2.7 |
| All farms | 14,362 | 229 | 91 | 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 have higher order sharemilkers, who have higher production per farm than have owner operators. Variable order sharemilkers show the highest per cow production level.

### Table 5.4: 1998/99 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 | 672,289 | 31,923 | 23,929 | 381 | 284 | 143 | 106 |
| Contract milkers | 905,862 | 43,115 | 32,291 | 413 | 308 | 154 | 115 |
| Sharemilkers | | | | | | | |
| Less than 20% | 1,024,717 | 49,388 | 36,953 | 435 | 325 | 160 | 120 |
| 20 - 28% | 846,499 | 40,761 | 30,362 | 420 | 312 | 156 | 115 |
| 29% | 662,394 | 31,907 | 23,727 | 377 | 279 | 148 | 110 |
| 30 - 38% | 798,073 | 38,292 | 28,651 | 399 | 297 | 153 | 114 |
| 39% | 570,717 | 28,344 | 20,791 | 372 | 272 | 147 | 108 |
| 40 - 44% | 697,324 | 33,721 | 25,184 | 378 | 281 | 149 | 111 |
| 50/50 (45-55%) | 848,162 | 40,474 | 30,355 | 409 | 305 | 153 | 114 |
| All Sharemilkers | 839,981 | 40,216 | 30,099 | 410 | 305 | 153 | 114 |
| All farms | 735,544 | 35,047 | 26,254 | 392 | 292 | 147 | 109 |

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 1988/89 to 1998/99, whereas, Table 5.6 gives the actual number of farms. The seasons 1991/92 to 1993/94 have a large proportion of farms where the operating structure is unknown, which makes comparisons difficult.

### Table 5.5: Trend in the percentage of farms in each operating structure since 1988/89

| Operating Structure | 1988/89 | 1989/90 | 1990/91 | 1991/92 | 1992/93 | 1993/94 | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sharemilkers | | | | | | | | | | | |
| 29% | 2.6 | 2.4 | 2.4 | – | 0.9 | 0.8 | 1.1 | 0.9 | 0.8 | 0.8 | 0.8 |
| 39% | 2.9 | 2.7 | 1.1 | – | 0.9 | 0.7 | 0.9 | 0.9 | 0.7 | 0.6 | 0.5 |
| 50% | 22.4 | 20.0 | 23.4 | – | 19.4 | 18.6 | 24.9 | 24.5 | 23.4 | 23.9 | 23.7 |
| Contract | 2.1 | 3.3 | 1.0 | – | 0.0 | 0.7 | 0.6 | 0.8 | 1.3 | 1.2 | 1.1 |
| Other | 2.3 | 1.6 | 3.5 | – | 4.0 | 4.0 | 6.8 | 7.8 | 9.3 | 10.2 | 11.2 |
| All Sharemilkers | 32.3 | 30.0 | 31.4 | – | 25.1 | 24.8 | 34.2 | 35.0 | 35.6 | 36.7 | 37.3 |
| Owner Operators | 67.7 | 70.0 | 68.6 | – | 56.7 | 57.2 | 65.7 | 65.0 | 63.6 | 62.8 | 62.7 |
| Unknown | 0.0 | 0.0 | 0.0 | 100.0 | 18.2 | 18.0 | 0.0 | 0.0 | 0.9 | 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 1988/89

| Operating Structure | 1988/89 | 1989/90 | 1990/91 | 1991/92 | 1992/93 | 1993/94 | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sharemilkers | | | | | | | | | | | |
| 29% | 354 | 314 | 322 | – | 130 | 118 | 158 | 133 | 120 | 124 | 114 |
| 39% | 401 | 363 | 146 | – | 126 | 108 | 138 | 138 | 108 | 95 | 76 |
| 50% | 3,079 | 2,667 | 3,140 | – | 2,803 | 2,714 | 3,642 | 3,614 | 3,455 | 3,522 | 3,403 |
| Contract | 290 | 444 | 130 | – | 97 | 84 | 121 | 195 | 172 | 154 | |
| Other | 319 | 220 | 467 | – | 572 | 583 | 994 | 1,149 | 1,367 | 1,497 | 1,610 |
| All Sharemilkers | 4,443 | 4,008 | 4,205 | – | 3,631 | 3,620 | 5,016 | 5,155 | 5,245 | 5,410 | 5,357 |
| Owner Operators | 9,316 | 9,349 | 9,220 | – | 8,201 | 8,344 | 9,627 | 9,581 | 9,368 | 9,263 | 9,005 |
| Unknown | 985 | 1,238 | 1,260 | 13,899 | 2,626 | 2,633 | 6 | 0 | 128 | 0 | 0 |
| Total | 14,744 | 14,595 | 14,685 | 13,899 | 14,458 | 14,597 | 14,649 | 14,736 | 14,741 | 14,673 | 14,362 |

*– 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

- ***4.7% of herds have a positive EBL 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 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.

Testing during the 1998/99 season has seen:

- A decline in confirmed positive herds from 891 to 674
- The establishment of a Livestock Improvement blood serology laboratory at NMAC which analysed 99,458 samples since 1 November 1998
- 1298 herds achieve a "Free" herd status
- A decline in untested herds from 870 to 65

At the end of the 1998/1999 season 441 herds (65%) had culled the confirmed positive stock and require re-testing in 1999/2000 to determine herd status. Of the herds that still had known positives, 167 herds (25%) had less than 6 positive cows. A further 33 herds had from 6 to 10 positive cows (5%). Only 33 herds had more than 10 positive cows (5%). Table 6.1 provides a summary of progress 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 third 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* |
|---|---|---|---|---|
| Blood Positive | 891 | 6.1% | 674 | 4.7% |
| Individual Milk Positive | 68 | 0.5% | 67 | 0.5% |
| Pool Milk Positive | 108 | 0.7% | 19 | 0.1% |
| Monitored Positive (vat test only) | 91 | 0.6% | 30 | 0.2% |
| Suspect (purchased from positive herd) | 158 | 1.1% | 377 | 2.6% |
| Free | – | – | 1,298 | 9.0% |
| Negative Year 2 | 1,331 | 9.1% | 5,221 | 36.4% |
| Negative Year 1 | 5,718 | 39.0% | 5,100 | 35.5% |
| Provisionally Negative | – | – | 478 | 3.3% |
| Monitored Negative (vat test only) | 5,438 | 37.1% | 1,033 | 7.2% |
| Untested | 870 | 5.9% | 65 | 0.5% |
| TOTAL | 14,673 | | 14,362 | |

# B. Tuberculosis (TB) control

- ***Number of infected dairy herds decreases by 30.0 % in 1998/99***

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. Vectors are defined as wild animals that are considered a source of infection eg possums, ferrets.

In 1998/99 there were 135 infected dairy herds in New Zealand (Table 6.2), a decrease of 30.0 % from the previous season.

***Table 6.2:*** **1998/99 Tuberculosis (Tb) testing and results**

| | *Area vector status* | *Number of infected dairy herd June 1999* | *Number of dairy cattle tested* |
|---|---|---|---|
| Northland | Free | 0 | 107,513 |
| Auckland | Free | 0 | 64,821 |
| | Risk | 0 | 10,407 |
| Waikato | Free | 14 | 1,161,300 |
| | Risk | 8 | 151,723 |
| Bay of Plenty | Free | 2 | 99,480 |
| Gisborne | Free | 0 | 131 |
| Hawkes Bay | Free | 0 | 14,849 |
| | Risk | 0 | 3,694 |
| Taranaki | Free | 2 | 157,986 |
| Manawatu / Wanganui | Free | 1 | 111,933 |
| | Risk | 4 | 68,304 |
| Wellington | Risk | 15 | 105,202 |
| Nelson / Marlborough | Free | 2 | 42,357 |
| | Risk | 2 | 1,572 |
| West Coast | Free | 0 | 3,086 |
| | Risk | 67 | 120,159 |
| Canterbury | Free | 3 | 87,587 |
| | Risk | 3 | 70,180 |
| Otago | Free | 1 | 59,998 |
| | Risk | 8 | 64,654 |
| Southland | Free | 3 | 90,133 |
| | Risk | 0 | 15,835 |
| North Island | Free | 19 | 1,718,013 |
| | Risk | 27 | 339,330 |
| | Total | 46 | 2,057,343 |
| South Island | Free | 9 | 283,161 |
| | Risk | 80 | 272,400 |
| | Total | 89 | 555,561 |
| Total | Free | 28 | 2,001,174 |
| Total | Risk | 107 | 611,730 |
| New Zealand | Total | 135 | 2,612,904 |

**Sourced from Animal Health Board Annual Report for the year ending 30 June 1999*

# 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

**2** Central Auckland
Rodney
North Shore
Waitakere
Auckland
Manukau
Papakura
Franklin

**3** South Auckland
Thames/Coromandel
Hauraki
Waikato
Matamata/Piako
Hamilton
Waipa
Otorohanga
South Waikato

**4** Bay of Plenty
Western Bay of Plenty
Tauranga
Whakatane
Kawerau
Opotiki

**5** Central Plateau
Rotorua
Taupo

**6** Western Uplands
Waitomo
Ruapehu

**7** East Coast
Gisborne
Wairoa

**8** Hawkes Bay
Hastings
Napier
Central Hawkes Bay

**9** Taranaki
New Plymouth
Stratford
South Taranaki

**10** Wellington
Wanganui
Rangitikei
Manawatu
Palmerston North
Horowhenua
Kapiti
Porirua
Upper Hutt
Lower Hutt
Wellington

**11** Wairarapa
Tararua
Masterton
Carterton
South Wairarapa

**12** Nelson/Marlborough
Tasman
Nelson
Marlborough
Kaikoura

**13** West Coast
Buller
Grey
Westland

**14** North Canterbury
Hurunui
Waimakariri
Christchurch
Banks Peninsula
Selwyn
Ashburton

**15** South Canterbury
Timaru
MacKenzie
Waimate

**16** Otago
Waitaki
Central Otago
Queenstown/Lakes
Dunedin
Clutha

**17** Southland
Southland
Gore
Invercargill