

AN ECONOMIC SURVEY
OF NEW ZEALAND
TOWN MILK PRODUCERS

1985-86

R.G. MOFFITT

RESEARCH REPORT NO. 190

OCTOBER 1987

ISSN 0069-3790

AGRIBUSINESS & ECONOMICS RESEARCH UNIT

LINCOLN COLLEGE, CANTERBURY, NEW ZEALAND.



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PREFACE

This report is the thirteenth in an annual series of economic surveys of New Zealand town milk supply farms. These surveys have been undertaken by the Agricultural Economics Research Unit at Lincoln College on behalf of the New Zealand Milk Board and the Town Milk Producer's Federation of New Zealand (Inc.)

As in the past the major objective of this survey has been to estimate the average net farm income received by town milk producers in New Zealand. In addition however, the opportunity provided by the surveys has been used to collect additional data so that a more comprehensive profile of the industry emerges.

J.G. Pryde
Director

ACKNOWLEDGEMENTS

The Agribusiness and Economics Research Unit gratefully acknowledges the co-operation and assistance willingly provided by officers of the New Zealand Milk Board, Town Milk Producer's Federation of New Zealand (Inc.), and milk producer companies. In particular, thanks are expressed to the individual town milk producers for co-operating in the survey and making the information contained in their accounts available.

ABBREVIATIONS USED IN THIS REPORT

Avg.	Average
Assn	Association
c	cents
C.V.	Capital Value
Dairy prod. ha	Dairy production hectares
equip.	equipment
exps	expenses
ha	hectares
incl.	inclusive
l	litres
L.U.	Labour Units
m.	million
milk prod.	milk produced
M.P.	Milk Producer
N.A.	Not Available
no.	number
prod. ha	productive hectares
RSE	Relative Standard Error

SUMMARY OF THREE YEARS NEW ZEALAND

SURVEY RESULTS

Characteristic	1983-84	1984-85	1985-86
Farms Surveyed (No.)	152	152	152
Total Farm Area (ha/farm)	93.18	96.24	89.79
Dairy Productive Farm Area (ha/farm)	83.59	84.75	81.02
Daily Quota (l/farm)	763	795	774
Cows in Milk in December (cows/farm)	108.02	112.09	110.10
Labour Units (L.U./farm)	2.26	2.24	2.08
Milk Production (l/farm)	474,217	531,539	516,188
(l/dairy prod. ha)	5,673	6,272	6,373
(l/December Cow)	4,390	4,742	4,693
Total Value of Farm Assets (\$/farm)	644,460	681,133	583,348
Gross Revenue (\$/farm)	124,458	143,036	147,914
Total Expenditure (\$/farm)	97,767	111,076	114,510
Net Farm Income (\$/farm)	26,691	31,960	33,403
Net Income per Dairy Prod. ha (\$/ha)	319	377	412
Net Income per Daily Quota (\$/l)	35.0	40.2	43.2
Net Income per December Milking Cow (\$/Cow)	247	285	303
Net Income per Litre (cents/l)	5.63	6.01	6.47
Gross Revenue per Litre (cents/l)	26.24	26.91	28.65
Total Expenditure per December Milking Cow (\$/Cow)	905	991	1,040

SUMMARY

Physical and Production Aspects

1. The average total area of the New Zealand farms surveyed was 89.79 hectares. This was smaller than the 1984-85 survey figure (96.24 hectares). The average dairy productive area was 81.02 hectares which was also less than the average 84.75 hectares in 1984-85. For the South Island the average dairy productive area was similar to the 1984-85 result but in the 1985-86 year the North Island result was less.
2. The average daily quota recorded on the surveyed farms was 774 litres compared with the previous 1984-85 survey estimate of 795 litres. The North Island survey average of 809 litres was 12 per cent higher than the South Island average quota (721 litres).
3. The average number of cows being milked in December per farm was 110. In 1984-85 the corresponding figure was 112. The average number of cows being milked during the winter (in June 1985) was 80.
4. Total milk production per farm (516,188 litres) was three per cent less than the 1984-85 total (531,539 litres). North Island farms show a six per cent fall, and South Island farms a slight increase. In litres per productive hectare the North Island (6,825 litres per hectare) was 18 per cent ahead of the South (5,764 litres per hectare).
5. The proportion of milk sold at town milk quota prices was 61 per cent. This was similar to the 62 per cent for the 1984-85 survey. North Island farmers sold 62 per cent of their milk at quota prices and the South 58 per cent.
6. Milk production per December milking cow was 4,693 litres. This was similar to the previous year (4,742 litres).
7. The average total labour employed on survey farms (2.08 labour units) was less than the 1984-85 figure of 2.24 labour units. In the North Island the labour units per farm fell from 2.27 units to 2.06 units. A decrease from 2.19 to 2.09 labour units occurred in the South Island.

Financial Aspects

8. Average net farm income for all surveyed farms for 1985-86 was \$412 per dairy productive hectare. This was 9 per cent higher than the previous year (\$377 per hectare). The total net farm income was \$33,403 per farm. The average income per hectare for the North Island farms was \$469 (up 2 per cent) and for the South Island farms it was \$336 per hectare (up 30 per cent). Net farm income per December milking cow was \$311 in the North Island and \$290 per cow in the South.

9. Gross revenue for New Zealand surveyed farms was \$1,826 per dairy productive hectare. This was eight per cent higher compared with the previous year (\$1,688 per hectare). The total gross revenue per farm was \$147,914 or \$1,343 per December milking cow. The North Island farms had a nine per cent increase in gross revenue per hectare (to \$1,996) while the South Island farms had a seven per cent increase in gross revenue per hectare (to \$1,598).
10. Total expenditure per dairy productive hectare was \$1,413. This was eight per cent higher than the 1984-85 per hectare result. Expenditure per farm was \$114,510 or \$1040 per milking cow. The average North Island farm had an increase in expenditure of 12 per cent per hectare to \$1,527. There was a three per cent increase in the South Island expenditure per hectare result (to \$1,262).
11. Of the 26 farm expenditure components per dairy productive hectare, all but seven increased compared with the previous survey result. Labour expenses for all farms rose by 11 per cent (to \$209 per hectare), operating expenses were up six per cent (to \$691 per hectare), administration was up ten per cent (to \$43 per hectare), overheads were up by 16 per cent (to \$357 per hectare) but depreciation decreased by 11 per cent (to \$113 per hectare).
12. From the revenue from milk sales the average price received per litre of all milk produced can be calculated. For the current survey it was 24.5556 cents compared with 22.2828 cents in 1984-85 (an increase of 10.2 per cent). In the North Island the average price received for all milk was 25.1337 cents per litre (a rise of 11.4 per cent compared with the previous year) and in the South Island it was 23.6457 (an increase of 8.5 per cent).
13. Milk sales accounted for 85.7 per cent of gross revenue on the average farm (82.8 per cent in 1984-85).
14. Net farm income on a cents per litre of total milk produced basis was 6.47 cents compared with 6.01 cents in 1984-85 and 5.63 cents in 1983-84.
15. Livestock trading profit per dairy productive hectare fell by 19 per cent from \$212 per hectare in 1984-85 to \$178 per hectare in 1985-86. Dairy stock profit per December milking cow fell by 19 per cent to \$122 per cow.
16. The average value of total assets was \$601,340 for a 75.19 freehold hectare farm (\$7,998 per hectare). In 1984-85 total farm assets were \$704,105 for a 83.02 freehold hectare farm or \$8,481 per hectare.
17. Total liabilities per farm were \$162,335, a ten per cent fall in the survey figure from the previous year (\$178,933). Fixed liabilities fell by ten per cent and current liabilities also fell by 12 per cent.
18. Equity as a per cent of the value of all assets averaged 73 per cent. This was similar to the previous survey (75 per cent). North Island farms had a higher proportion (75 per cent) compared with South Island farms (70 per cent).

CHAPTER 1

BACKGROUND

1.1 Objectives of the National Farm Survey

As in previous years, the principal objective of the 1985-86 survey was to determine the average net farm income received by town milk producers in New Zealand. Information produced by the survey is used for a variety of purposes. It assists decisions concerning applications for price increases from specific producer groups. The national average cost and return results are also used as standards with which costs and return figures derived from smaller regional surveys can be compared. The survey data obtained each year also provide a continuing set of statistics on the economic position of town supply dairy farms. The availability of such information is of value to the individual farmer, regional advisers, and government policy makers.

No attempt has been made in the report to draw any conclusions on whether or not an increase in town milk prices is justified. The analyses have been carried out primarily to meet the basic objective of the survey, namely the determination of national net farm income.

1.2 Producer Prices¹

Traditionally the town milk producer price has been linked to the average manufacturing price for whole milk. An increase in price of one cent per kilogram of milkfat resulted in an increase of 0.06 cents per litre in the town milk producer price. These calculations are based on factory door values and include an allowance for collection costs made by the New Zealand Dairy Board.

The town milk producer price for the 1985-86 year commencing 1 September 1985, was based on a manufacturing price of 400 cents per kilogram of milkfat for whole milk at the farm gate.

Table 1 summarises the national average town milk producer prices for finest grade milk over the past four NZ Milk Board financial years.

Most producer companies are actually paid at standard seasonal prices which average back to the national average price referred to in Table 1. Some producer companies elect to vary their milk prices throughout the year to compensate for climatic conditions, or as a means of encouraging higher production in the more difficult production months. Where within-year variations of prices are utilised, the entire payout must average back to the national average price.

¹ NZ Milk Board Annual Reports for the years ended August 1985 and 1986

TABLE 1

National Average Town Milk Producer Prices

Year Commencing 1st September	Finest Grade Final Price (cents per litre)
1982	22.9593
1983 (to 29 February 1984)	23.4303
1983 (1 March to 31 August 1984)	24.0405
1984 (to 8 Nov 1984)	24.0645
1984 (9 Nov 1984 to 31 August 1985)	26.8563
1985	27.8355

Source: NZ Milk Board Annual Report for the year ended August 1986, p.6.

Additional funds for special production allowances were made available for certain regions over and above the basic price payable to town milk suppliers. The purpose of the extra allowances was to help offset the higher costs of production in those regions. Government approved an increase in the special production allowances of \$1.2 million a year for three years from 1 September 1983.

Table 2 summarises the additional district special production allowances for 1985 and 1986.

1.3 Town Milk Production Data

Total town milk production in the year ending 31 August 1986 was over 673 million litres.² Table 3 shows the total production and sale of milk passing through the National Milk Scheme for the years ending 31 August 1984, 1985 and 1986.

² Ibid., p.17

TABLE 2

Town Milk Additional District Allowances for 1985 and 1986

District	Cents per litre over six autumn and winter months for the year ended 31 August	
	1985	1986
Rotorua	0.80	0.80
Tokoroa (excluding Putaruru & Hodderville)	0.60	0.60
Gisborne (excluding Wairoa)	2.50	2.50
Hawke's Bay (excluding Maharahara)	1.25	1.25
Ruapehu	2.25	0
Blenheim	1.25	1.25
Nelson	1.25	1.25
Grey District	0.60	0.60
Christchurch	1.70	1.25
Ashburton	1.25	1.25
South Canterbury	1.25	1.25
North Otago	2.00	1.25
Dunedin/Balclutha	1.80	1.80
Central Otago	3.50	3.50
Southland	3.25	3.25

Source: NZ Milk Board Annual Report for the year ended August 1986,
p.22.

TABLE 3

Total Town Milk Production

Year Ending 31 August	Milk Production m. litres	Quantity Eligible for Town Milk Price m. litres	Total Town Sales m. litres
1984	679.7172	427.5514	350.3541
1985	691.4023	422.7388	349.4222
1986	673.9108	421.6077	339.3382

Source: NZ Milk Board Annual Report for the year ended August 1986,
p.17.

Total milk sales to consumers for the year ended 31 August 1986 were 339,338,171 litres. This represents a decline of 2.88 per cent over the previous year. There was a consumer price increase of five cents per 600ml bottle on 1 September 1985. Sales declined with little signs of recovery until April 1986. Per capita consumption of milk was 106.5 litres, compared with 110.02 litres the previous year.

1.4 Town Milk Suppliers and Quotas

There were 1,254 town milk quota holders³ during the 1985-86 milk year compared with 1,247 for the previous year, and in addition, there was one dairy company quota holder. A summary of the number of quota and sub-quota holders over the past four years is given in Table 4, while Table 5 gives details of the one quota holding dairy company in 1985-86.

TABLE 4
Total Milk Suppliers and Daily Quotas

Year Ending 31 August	Type of Quota Holders	Total Nominated Quantity (1)	No. Town Milk Suppliers & Sub-quota Holders	Average Daily Quota per Supplier (1)
1984	Total NZ Suppliers	1,021,079	1,278	799
	2 Dairy Companies	13,251	42	316
	Quota and Sub- quota Holders	1,034,330	1,320	784
1985	Total NZ Suppliers	1,012,409	1,247	812
	1 Dairy Company	13,251	41	323
	Quota and Sub-quota Holders	1,025,660	1,288	796
1986	Total NZ Suppliers	1,011,108	1,214	833
	1 Dairy Company	13,212	40	330
	Quota and Sub-quota Holders	1,024,320	1,254	817

Source: NZ Milk Board, pers. comm.

³ NZ Milk Board, pers. comm.

TABLE 5
Quota Holding Company 1985-86

Name of Company	Quota Held (Litres)	Supply District	No. of sub-quota holders
East Tamaki	13,212	Auckland	40

Source: NZ Milk Board, pers. comm.

Nominated quantities, which producer associations contract to guarantee to meet the daily liquid milk requirements in their area throughout the year, are based on estimated demand in accordance with an agreed formula. Due to the continuing decline in sales since regular price increases began in 1976, nominated quantities have been reducing also.

The agreed formula for fixing nominated quantities is as follows:

1. Average daily sales calculated by taking the net sales by milk stations to vendors over a period of two consecutive winter months and dividing by the appropriate number of days in the period.
2. The resultant daily sales figures to be increased by a tolerance factor of 3.25 per cent to cover returned milk, wastage and other factors.
3. The resultant figure to be adjusted to include an allowance for expected changes in the population.

⁴ Ibid., p.3.

CHAPTER 2

DESCRIPTION OF THE SURVEY

2.1 The Sample

The sampling unit for the survey is the farm, and the main sources of information, the farmer and the annual farm accounts.

Every three years a new sample of town supply farmers is randomly selected. Most of the farmers interviewed for the 1985-86 survey were new participants. All town supply farmers were eligible for selection provided the following criteria were satisfied.

- (i) The farm supplied a producer association that had a nominated quantity (N.Q.) of more than 6,500 litres daily.
- (ii) The farm itself had a daily quota of more than 200 litres.
- (iii) The farm received at least 75 per cent of gross revenue from milk sales and related dairy activities.
- (iv) The farmer had been producing town milk on that particular farm over the twelve months of the survey period.

The decision on eligibility was carried out in two stages. Firstly, information available from the Milk Board prior to sample selection enabled farms not satisfying (i) and (ii) above to be eliminated from the total population. Also, results from a questionnaire which had been sent to each producer company secretary seeking information on the sharemilkers in each company enabled farms to be further eliminated on the basis of (iv). The second stage at which a decision was made on eligibility was at the time of the farm visit when further farms were eliminated because of either (iii) or (v).

Of an initial list of 1214 farms provided by the Milk Board, the eligible population was reduced under (i), (ii) and (iv) to 806 prior to sample selection. Replacement farms were selected at random from the reduced list and the farmers initially contacted by mail. Provided that the farm was found to be eligible and the farmer agreed to participate in the survey, a farm visit was undertaken by Lincoln College staff and the required information obtained. Where farms were found to be ineligible or the farmer unwilling to participate, further replacement farmers were contacted until sufficient numbers were obtained.

2.2 Sample Stratification

The sample was stratified on the basis of two regional groups (North Island and South Island) and three quota sizes (201-600 litres, 601-1000 litres and 1001+ litres).

Table 6 shows the number of survey farms for each strata or group compared with the eligible population for each strata. Further details are given in Appendix C.

TABLE 6
Population and Sample Distribution by Strata^a

Strata	Estimated Total No. of Farms in Strata	Estimated Proportion of Total Farms in Strata	Number of Farms Surveyed	Proportion of Total Farms Surveyed
<u>North Island</u>				
201-600 litres	124	0.1744	21	0.14
601-1000 litres	185	0.2630	38	0.25
1001+ litres	115	0.1665	17	0.11
Total North Island	424		76	0.50
<u>South Island</u>				
201-600 litres	135	0.1921	26	0.17
601-1000 litres	92	0.1332	34	0.22
1001+ litres	49	0.0708	16	0.11
Total South Island	276		76	0.50
New Zealand	700	1.0000	152	1.00

^a See Appendix C

2.3 Weighting

Since the South Island strata were sampled relatively more heavily than the North Island, a simple average of all survey farms would have given a biased national figure. The estimated proportion of the total farms in each strata (Table 6) was therefore used to "weight" the average from each strata to give the overall New Zealand results (and also the North Island and South Island results). This procedure ensures that each strata assumes its correct degree of importance in the final results.

2.4 Data Collection and Assembly

To maintain uniformity and continuity of the survey, the manual of procedures introduced by the New Zealand Milk Board and the Town Milk Producers' Federation of New Zealand (Inc.) was followed. Appendix B gives details of definitions, procedures and imputed values used.

A set of farm working accounts for the 1985-86 financial year was obtained from the farmer or his accountant. Milk production records for the farms surveyed were provided from the records of producer associations. Partnerships and companies were treated as owner-operated farms by assuming one of the partners (members) as owner, and the other(s) as employee(s), provided they were engaged in farm work.

Wherever possible, data were transferred directly from the farm accounts to the relevant income and expenditure categories on the survey assembly form. Trade discounts, subsidies and allowances for personal use were deducted from the appropriate expense item before entry. Other adjustments included the calculation of an imputed wage for any unpaid family labour and the assessment of a standard livestock value for each set of accounts.

TABLE 7

Balance Dates of Annual Accounts 1985-86

	North Island	South Island	New Zealand
Number of Farms	76	76	152
<u>Month Ending</u>	%	%	%
March	52	71	62
April	1	1	1
May	20	3	11
June	22	21	22
August	5	4	4
Total	100	100	100

All financial and production data collected referred to the farm's financial year. Table 7 shows the distribution of farm account balance dates of the 152 participating farmers in the 1985-86 survey. It can be seen that 62 per cent of all balance dates were March 31st.

Financial results for the survey farms were derived largely from the farm accounts. In cases where these showed insufficient detail, further information was sought from the farmer and/or accountant.

CHAPTER 3

PHYSICAL AND PRODUCTION DATA

3.1 Physical Characteristics of Farms

3.1.1. Farm Area

Table 8 shows the average total farm area and average productive area of the North Island, South Island and average New Zealand survey farms. The same table is broken by region and quota group in Appendix E.

The average total size of the farm including run-off area for North Island farms was 85.54 hectares, for South Island farms 97.80 hectares, and for the average New Zealand farm, 89.79 hectares.

An estimate of the dairy productive area used for milk production also appears in Table 8. On the North Island farms more land was used for sheep, beef and cash crops (9.03 hectares) compared with the South Island. The dairy productive area on the average North Island farm was 76.61 hectares. This was over 11 hectares less than the 87.75 hectares for the South Island average farm.

Figure 1 is a graphic representation of the North and South Island farm areas.

TABLE 8
Average Areas of Town Supply Farms

	North Island	South Island	New Zealand
Number of Farms Surveyed	76	76	152
	ha	ha	ha
Freehold Area	69.05	84.54	75.19
Crown & Maori Lease	1.89	6.11	3.56
Rented Area	13.60	7.15	11.04
Total Farm Area	84.54	97.80	89.79
Less Unproductive Area	4.45	5.52	4.87
Productive Area	80.09	92.28	84.92
Less Estimated Sheep, Beef and Cash Crop Area	9.03	6.68	8.10
Plus Estimated 'Grazing' Out Area	5.55	2.15	4.20
Dairy Productive Area Utilised for Milk Production	76.61	87.75	81.02

FIGURE 1
Average Areas of North and South Island
Town Milk Farms

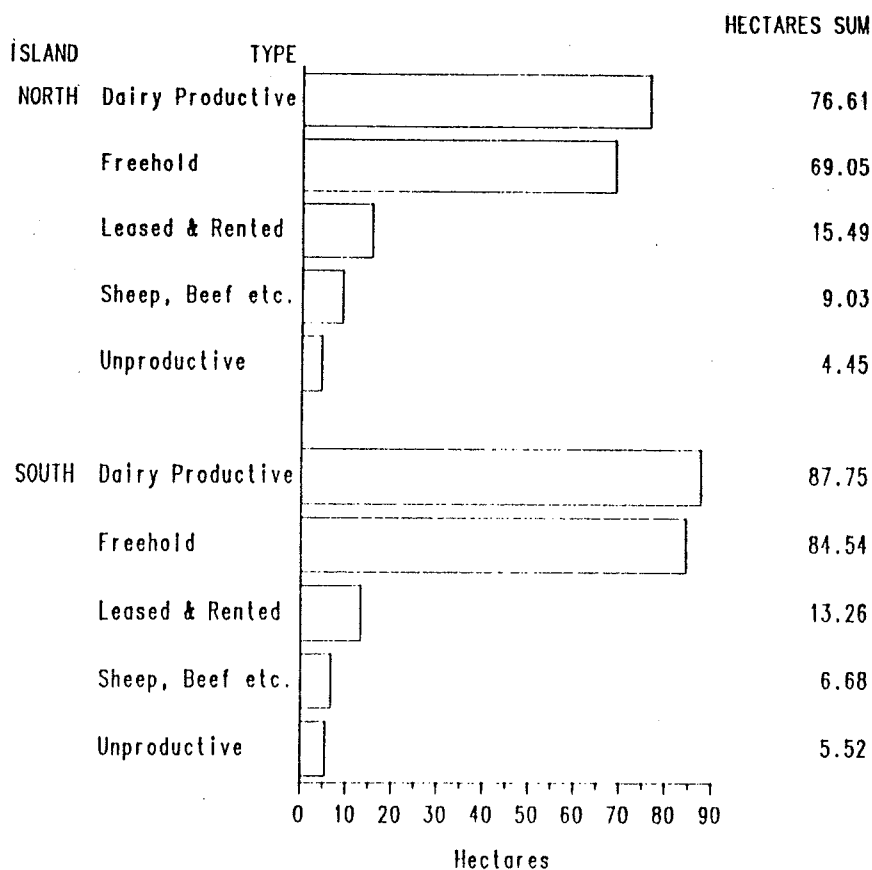
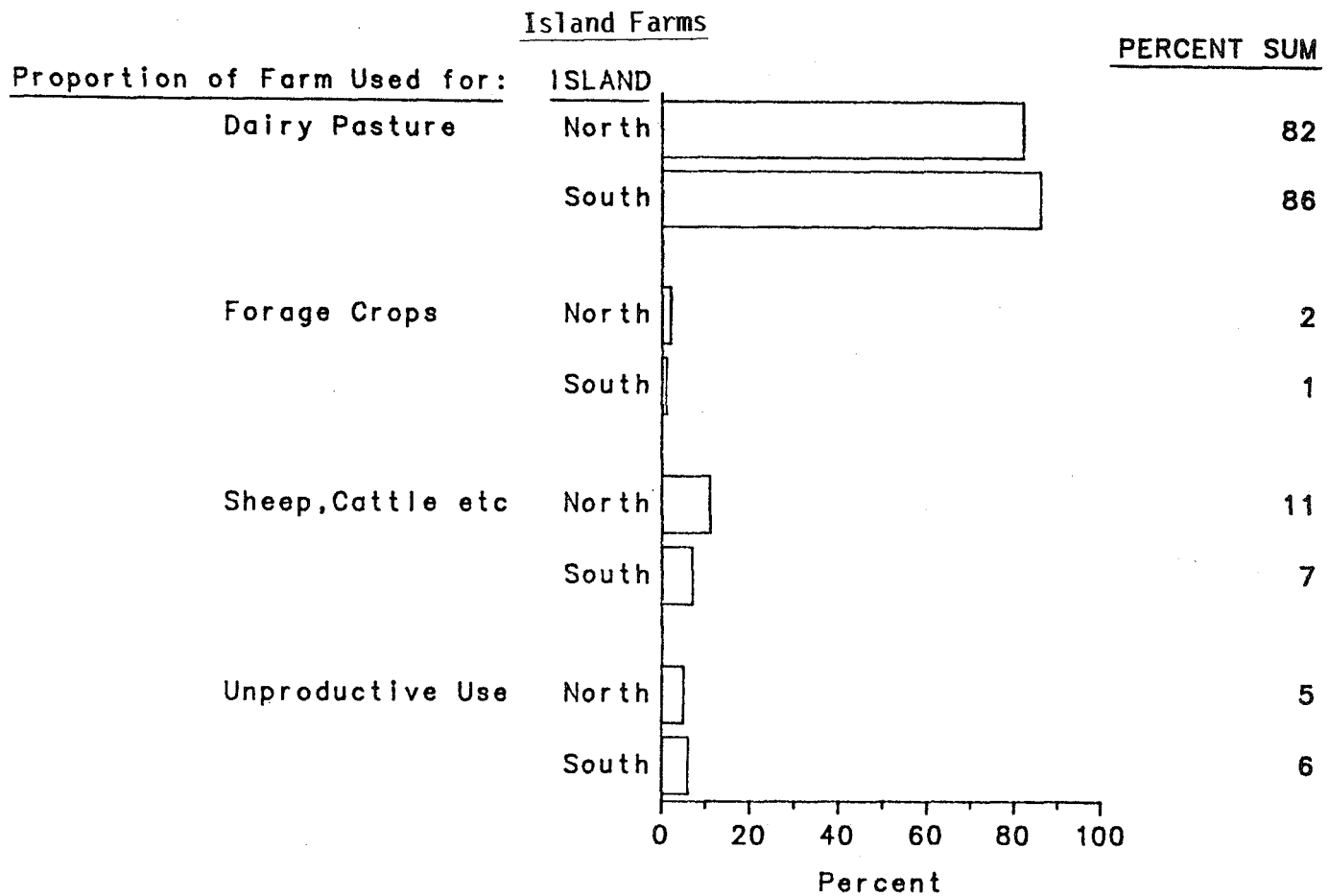


TABLE 9
Utilisation of Farm Area

	North Island	South Island	New Zealand
Number of Farms Surveyed	76	76	152
Proportion of Farm Area under:	%	%	%
- Dairy Pasture	82	86	84
- Forage Crops	2	1	2
- Sheep & Beef Cattle Pasture & Cash Crops	11	7	9
- Unproductive Land	5	6	5
Total	100.0	100.0	100.0

FIGURE 2
Utilisation of Farm Area on North and South



3.1.2. Land Use

Table 9 and Figure 2 give a brief summary of land use on the surveyed farms. The non-productive area on individual farms ranged up to 32.38 hectares in the North Island and up to 50.0 hectares in the South Island. Much of this land was in gorse, bush or scrub.

3.1.3. Irrigation

Forty-nine per cent (37 farms) of the surveyed South Island farms used irrigation during the year compared with 12 per cent (nine farms) in the North Island (see Table 10). The average percentage of dairy productive land which was irrigated on these 46 farms was 50 per cent.

TABLE 10
Irrigation Use^a

	North Island	South Island	New Zealand
Number of Farms Surveyed	76	76	152
Number of Farms Using Irrigation	9	37	46
- Percentage of Dairy Productive Area Irrigated	37	70	50
- Estimated Total Hours Irrigating	572	1,248	840

^a These results do not include weighted means. The average is calculated according to the number of practising farmers.

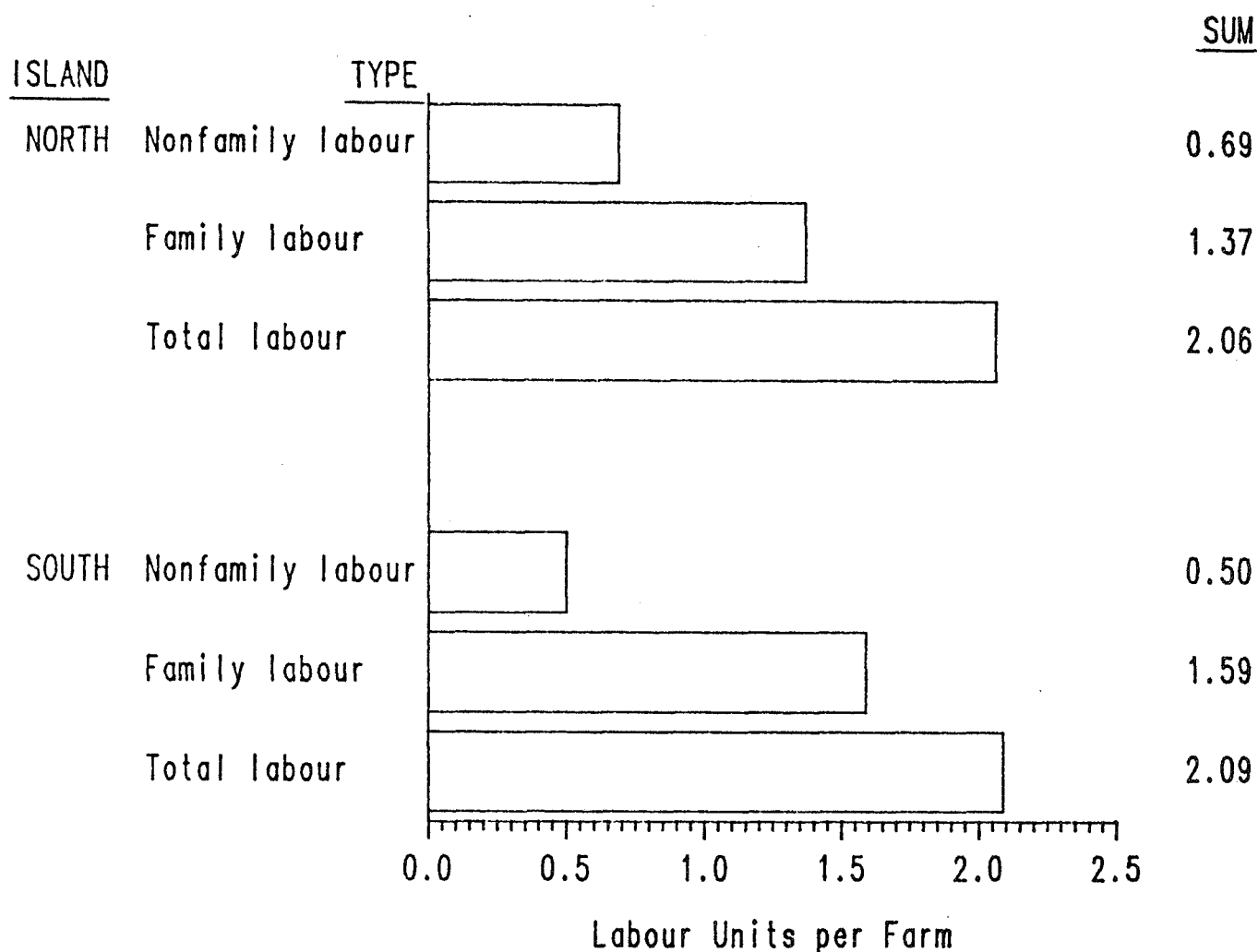
TABLE 11
Types of Labour Units

	North Island	South Island	New Zealand
Number of Farms Surveyed	76	76	152
Farmer	0.92	0.97	0.94
Permanent Family	0.43	0.54	0.48
Casual Family	0.02	0.08	0.05
Total Family Labour Units	1.37	1.59	1.47
Permanent Non-Family	0.61	0.42	0.53
Casual Non-Family	0.08	0.08	0.08
Total Non-Family Labour Units	0.69	0.50	0.61
Total Labour Units	2.06	2.09	2.08
Proportion of Permanent Labour	95%	92%	94%
Proportion of Family Labour	67%	76%	71%

3.2 Labour

The average survey farm employed a total of 2.08 labour units (see Table 11 and Figure 3). This was less than the 1984-85 figure of 2.24 labour units. There was little difference in the percentage of permanent labour between the two Islands.

FIGURE 3
Labour Units on North and South
Island Farms



3.3 Milk Production

The daily quota per surveyed farm was 774 litres (Table 12 and Figure 4), compared with the previous year's New Zealand survey estimate of 795 litres. The average North Island quota was 12.2 per cent higher than the average South Island quota (809 and 721 litres). Total annual milk production per dairy productive hectare for NZ slightly increased (from 6,272 litres per hectare in 1984-85 to 6373 litres). Litres per December milking cow showed a marginal fall from 4,742 in the previous year to 4,693 in the 1985-86 year.

Because the average farm areas and quota sizes are different, less biased comparisons can be made between the Islands by comparing results per hectare or per cow. Between the two Islands stocking rates were higher on the North Island farms (up 30 per cent to 1.51 December cows per dairy productive hectare).

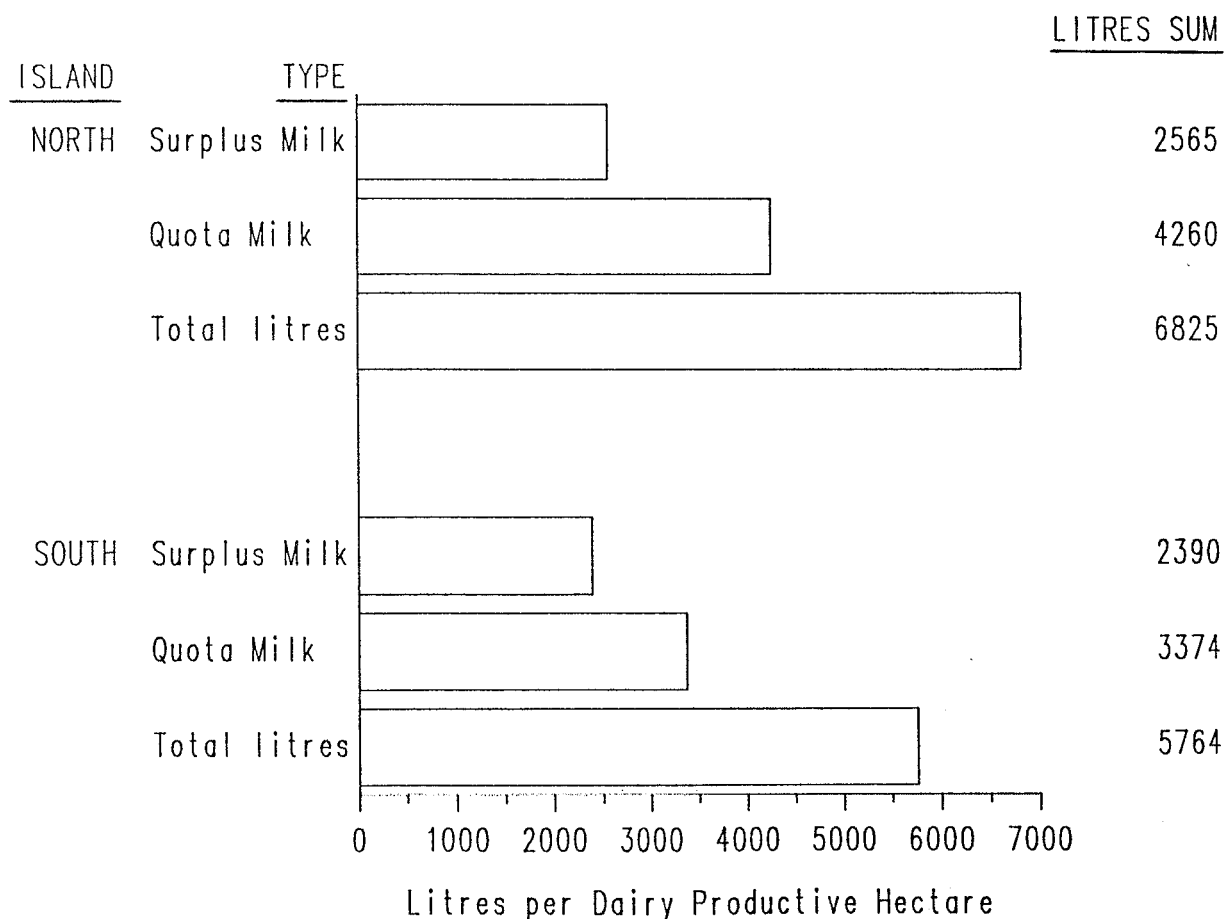
When the total litres produced per farm is converted to milkfat at a 4.18 per cent test⁵ the average North Island townmilk farm produced 285 kg per dairy productive hectare (up 18.3 per cent) compared with the average South Island farm at 241 kg.

The average North Island supplier stocked 40 per cent more cows per dairy productive hectare in June compared with the South Island supplier. There was less available dairy productive land on the North Island farms (76.6 hectares). The South Island producer had more available land (87.8 hectares) but a lower stocking rate. Due to the heavier stocking the North Island farmer produced over eighteen per cent more milk per dairy productive hectare.

Details of milk production per dairy productive hectare and per December milking cow for the last five town milk surveys appear in Figures 5 & 6.

FIGURE 4

Milk Production per Dairy Productive Hectare in Both Islands



⁵ NZ Milk Board Annual Report for the year ended August 1985, p. 28.

TABLE 12
Milk Production

	North Island	South Island	New Zealand
Number of Farms Surveyed	76	76	152
Daily Quota (1)	809	721	774
Dairy Productive Hectares (ha)	76.6	87.8	81.0
Milk Production			
Sold at Quota Prices (1)	326,298	296,203	314,375
Milk Production			
Sold at Surplus Prices (1)	196,511	209,902	201,813
Total Litres Produced (1)	522,809	506,105	516,188
Proportion of Total Sold at Quota Prices (%)	62%	58%	61%
Average No. Milking Cows in:			
Feb 1985	109	96	104
Apr 1985	101	86	95
Jun 1985	86	70	80
Aug 1985	95	73	86
Oct 1985	116	99	109
Dec 1985	116	102	110
Total Litres Converted to 4.18% ^a Milk Fat (kg)	21,853	21,155	21,577
Kg. Milk Fat/Dairy Productive ha (kg)	285	241	266
Litres/December Milking Cows (1)	4,507	4,962	4,693
Litres/Dairy Productive ha (1)	6,825	5,764	6,373
December Cows/Dairy Productive ha (No.)	1.51	1.16	1.36
June Cows/Dairy Productive ha (No.)	1.12	0.80	0.99

a NZ Milk Board Annual Report 1986, p.28.

FIGURE 5

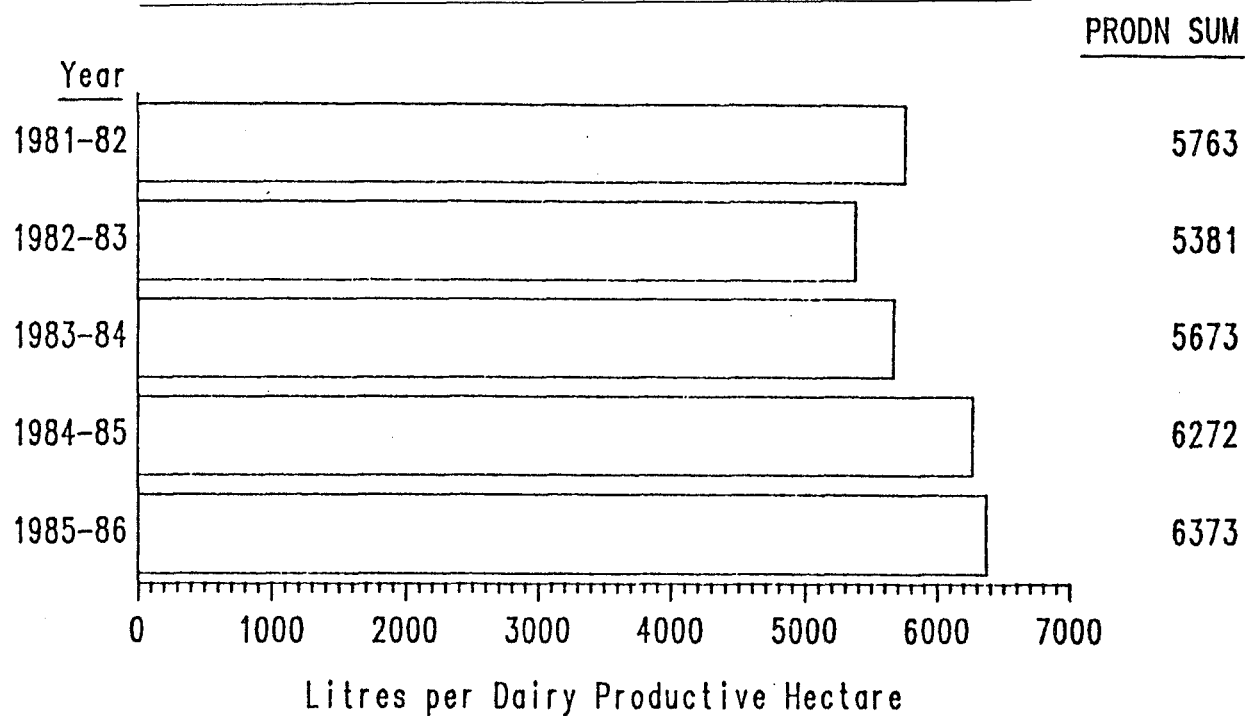
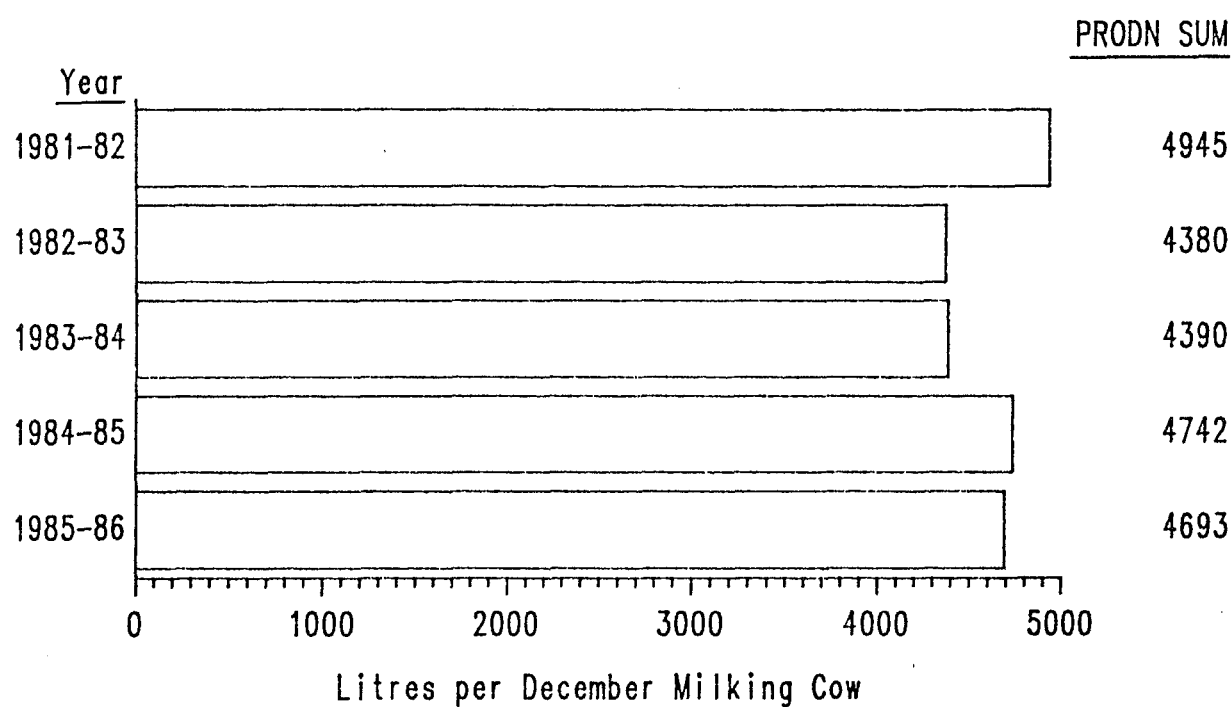
Five Years Milk Production per Dairy Productive Hectare

FIGURE 6

Five Years Milk Production per December Milking Cow

3.4 Other Physical and Production Data

3.4.1. Supplementary Feed Use

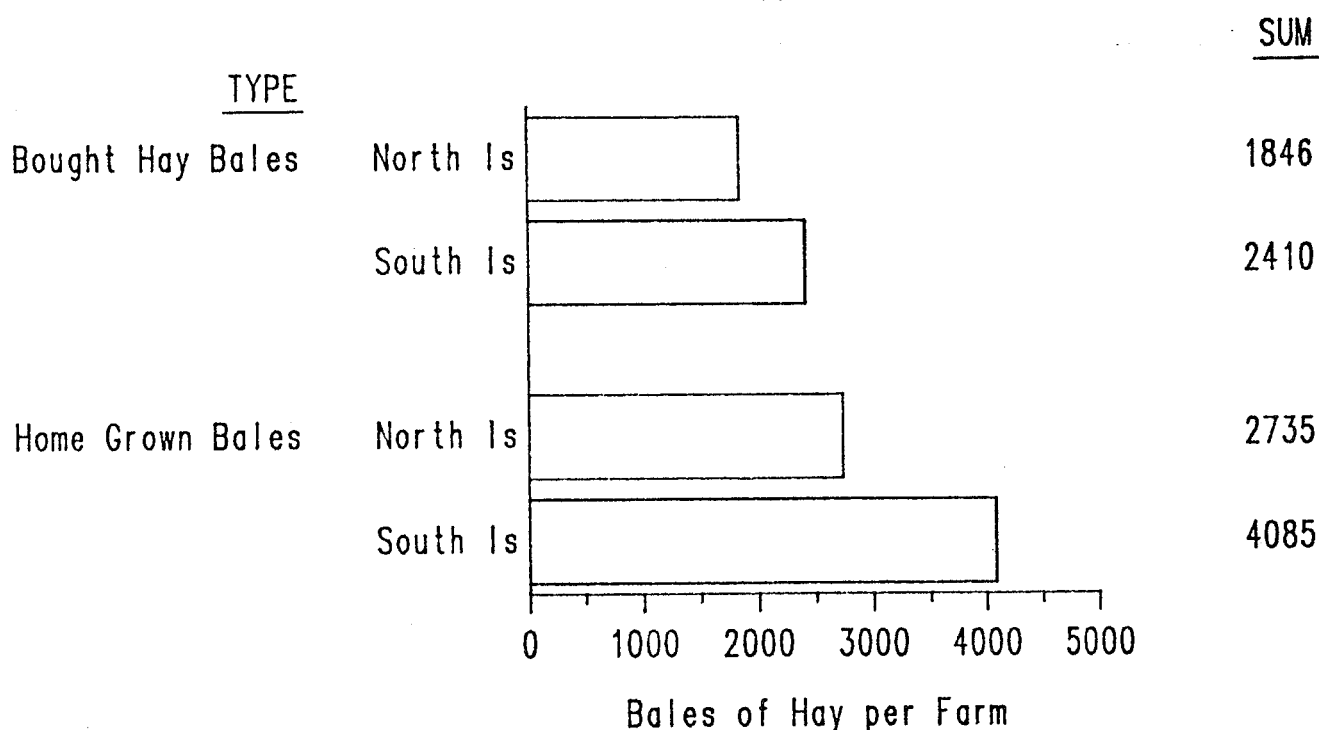
In Table 13 the various forms of supplementary feed are listed. In all but one type, South Island farms make, grow and purchase more supplementary feed compared with the North Island. The exception is forage crops. More North Island farmers grew a larger average area of forage crops in 1985-86.

South Island farms which grow and purchase hay (Figure 7) had a total of 6495 bales of hay per farm (64 bales per December cow). This is approaching twice the number per cow for the equivalent North Island farm (39 per cow).

FIGURE 7

Supplementary Feed - Bales of Hay Made and Bought

in Both Islands



3.4.2. Run-Off Area

In both Islands approximately 44 per cent of farms had a run-off area (Table 14). The average run-off in the two Islands was similar in size (just over 27 hectares).

3.4.3. Non-Family Adult Worker's Annual Wage

In both Islands over a third of the surveyed farms employed an adult non-family employee (Table 15). In the North Island the average annual wage paid on these farms was \$15,054. This was 3 per cent higher than the wage paid on the South Island town milk farms (\$14,573).

TABLE 13
Supplementary Feed Use ^a

	North Island	South Island	New Zealand
Number of Farms Surveyed	76	76	152
Number of Farms with Home Grown Hay	69	73	142
- Average No. of Home Grown Bales per Farm	2,735	4,085	3,429
Number of Farms with Purchased Hay	32	47	79
- Average No. of Purchased Bales	1,846	2,410	2,182
Number of Farms Making Silage	63	65	128
- Average No. of tonnes of Silage Made	381	534	459
Number of Farms with Home Grown Grain	0	10	10
- Average No. of tonnes of Home Grown Grain	0	29	29
Number of Farms with Purchased Grain	5	17	22
- Average tonnes of Purchased Grain	26.8	30.3	29.5
Number of Farms with Purchased Dairy Meal	17	18	35
- Average tonnes of Dairy Meal Purchased	6.9	20.6	13.9
Number of Farms Growing a Forage Crop	31	25	56
- Average Hectares Grown	3.39	3.32	3.36

^a These results do not include weighted means. The average is calculated according to the number of practising farms.

TABLE 14

Run-Off Area ^a

	North Island	South Island	New Zealand
Number of Farms Surveyed	76	76	152
Number of Farms with a Run-off	43	44	87
- Run-Off Area (ha)	27.4	27.2	27.3
- Distance from Home Farm to Run-Off (km)	6.3	7.5	6.9

^a These results do not include weighted means. The average is calculated according to the number of practising farms.

TABLE 15

Non-Family Adult Worker's Annual Wage Paid and
Years of Experience ^a

	North Island	South Island	New Zealand
Number Surveyed	76	76	152
Non-Family Adult Workers:			
- Number of Farms With a Worker for a Full Year	29	27	56
- Annual Average Wage Paid (\$)	15,054	14,573	14,822
- Previous Years of Dairy Experience	5.9	6.5	6.2

^a These results do not include weighted means. The average is calculated according to the number of practising farms.

3.4.4. Dairy and Other Stock Balances

In Tables 16 & 17 the New Zealand dairy and other stock balances are listed. The stock standard values used in these tables are detailed in Appendix B.

TABLE 16
Dairy Stock Balances

New Zealand			New Zealand		
Opening Stock	Average No. Per Farm	Value \$	Closing Stock	Average No. Per Farm	Value \$
All Cows	118.2	14,775	All Cows	124.5.	15,563
Heifers-in-Calf	27.9	2,790	Heifers-in Calf	28.4	2,840
Other Dairy Stock	52.2	5,721	Other Dairy Stock	56.1.	6,393
Sub-total	198.3		Sub-total	209.0	
Purchases:					
Cows and in-calf					
Heifers	5.3	2,746	Cull Cows Sold	18.7	7,209
Others Purchases	2.5	678	Others Sold	60.2.	8,112
Natural Increases					
Calves Bred (No.)	86.3		Deaths, Missing	4.5	
Dairy Stock Profit		13,407			
Opening Balance	292.4	40,117	Closing Balance	292.4	40,117

TABLE 17
Beef and Sheep Stock Balances

	New Zealand			New Zealand	
Opening Stock	Average No. Per Farm	Value \$	Closing Stock	Average No. Per Farm	Value \$
Sheep:					
Ewes	26.6	266	Ewes	37.9	379
Other Sheep	15.2	134	Other Sheep	11.3	110
Beef:			Beef:		
Beef Cattle	6.5	416	Beef Cattle	7.1	1,020
Sub-total	48.3		Sub-total	56.3	
Purchases:			Sales:		
Sheep Purchased	3.8	61	Sheep Sold	23.6	337
Beef Cattle			Beef Cattle Sold	0.4	99
Purchased	0.8	29	Deaths, Missing etc.	3.1	
Natural Increase Number	31.0				
Other Stock Profit		1,039			
Opening Balance	83.4	1,945	Closing Balance	83.4	1,945

CHAPTER 4

FINANCIAL DATA

4.1 Introduction

Many of the tables in this Chapter have results presented on a per farm, per average December milking cow and a per dairy productive hectare basis.

The reliability of the survey estimates are presented in Appendix C. Some comparisons with the results from the previous five years are presented in Appendix E.

4.2 Capital Structure

Details of the procedures adopted in assessing the capital value of assets and liabilities are listed in Appendix B. They are similar to those followed in previous surveys.

4.2.1. Value of all Assets

The total value of all assets on the average 75.19 freehold hectare New Zealand survey farm was \$601,340 or \$7,422 per dairy productive hectare (see Table 18). This was twelve per cent lower than the 1984-85 asset value of \$8,308 per dairy productive hectare. For each December milking cow there were \$5,462 of assets.

The average North Island farm had an all assets total of \$8,676 per dairy productive hectare. This was 51 per cent higher than the South Island figure of \$5,753 per hectare. In 1983-84 the difference in asset value per farm between the two Islands was \$2,396 per dairy productive hectare, and in 1984-85 it was \$2,745, but by 1985-86 it had increased to \$2,923 per dairy productive hectare. This trend highlights the more rapid rise in North Island land values. In Figure 8 the total farm assets from the last five years surveys are listed.

FIGURE 8

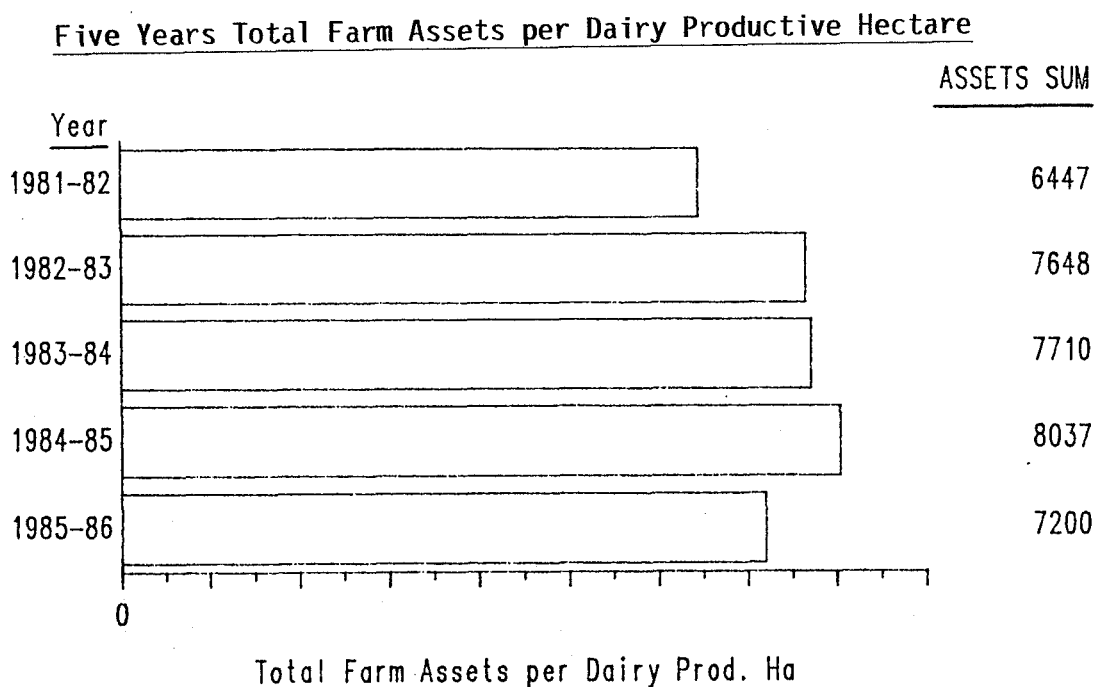


TABLE 18

Capital Structure - Value of all Assets and Liabilities

	North Island			South Island			New Zealand		
	Per Farm	Per Cow	Per Dairy Prod. ha	Per Farm	Per Cow	Per Dairy Prod. ha	Per Farm	Per Cow	Per Dairy Prod. ha
Total Litres Produced	522,809	4,523	6,824	506,105	4,975	5,768	516,188	4,688	6,371
Cows in Milk in Dec. 1985	115.60			101.72			110.10		
Dairy Prod. hectares	76.61			87.75			81.02		
	\$	\$	\$	\$	\$	\$	\$	\$	\$
Assets									
Freehold Land (valued at 31.12.85)	522,070	4,516	6,815	353,321	3,473	4,026	455,226	4,135	5,618
Farmer's House (1/2 Book Value)	24,320	210	317	20,528	202	234	22,818	207	282
Other Farm Houses	10,549	91	138	6,463	64	74	8,931	81	110
Farm Buildings	20,967	181	274	23,498	231	268	21,969	199	271
Plant and Equipment	11,986	104	156	19,935	196	227	15,135	137	187
Farm Vehicles	25,941	225	338	27,334	269	311	26,493	241	327
Dairy Stock	25,275	219	330	24,066	237	274	24,796	225	306
Other Stock	2,330	20	31	258	2	3	1,509	14	19
Company Shares	1,863	16	24	2,872	28	33	2,263	21	28
Total Farm Assets	645,301	5,582	8,423	478,275	4,702	5,450	579,140	5,260	7,148
Cash at Bank	8,102	70	106	11,536	113	131	9,463	86	117
Sundry Debtors	8,178	71	107	8,269	81	94	8,214	75	101
Other Current Assets	3,079	27	40	6,723	66	77	4,523	41	56
Total All Assets	664,660	5,750	8,676	504,803	4,962	5,752	601,340	5,462	7,422

(Table 18 cont....)

TABLE 18 (cont.)

Capital Structure - Value of All Assets and Liabilities

	North Island			South Island			New Zealand		
	Per Farm	Per Cow	Per Dairy Prod. ha	Per Farm	Per Cow	Per Dairy Prod. ha	Per Farm	Per Cow	Per Dairy Prod. ha
	\$	\$	\$	\$	\$	\$	\$	\$	\$
<u>Current Liabilities</u>									
Bank Overdraft	9,195	80	120	7,560	74	86	8,547	78	106
Sundry Creditors	8,365	72	109	9,524	94	109	8,824	80	109
Other Current Liabilities	2,902	25	38	5,480	54	62	3,922	35	48
Total Current Liabilities	20,462	177	267	22,564	222	257	21,293	193	263
<u>Fixed Liabilities</u>									
Rural Bank Mortgages	42,898	371	560	60,991	600	695	50,062	455	618
Trading Bank Mortgages	17,378	150	227	11,714	115	133	15,136	137	187
Building Society Mortgages	4,828	42	63	1,066	10	12	3,338	30	41
Insurance Company Loans	12,596	109	165	8,860	87	101	11,116	101	137
Stock Firm Loans	1,113	10	15	1,381	14	16	1,219	11	15
Finance Company Loans	3,852	33	50	2,332	23	27	3,250	30	40
Solicitors Loans	30,526	264	398	15,941	157	182	24,749	225	306
Family Mortgages	30,979	268	404	21,676	213	247	27,293	248	337
Other Liabilities	4,320	38	56	5,732	56	65	4,879	44	60
Total Fixed Liabilities	148,490	1,285	1,938	129,693	1,275	1,478	141,042	1,281	1,741
Total All Liabilities	168,952	1,462	2,205	152,257	1,497	1,735	162,335	1,474	2,004
Equity	495,708	4,288	6,471	352,546	3,466	4,018	439,005	3,988	5,418
Total	664,660	5,750	8,676	504,803	4,963	5,753	601,340	5,462	7,422

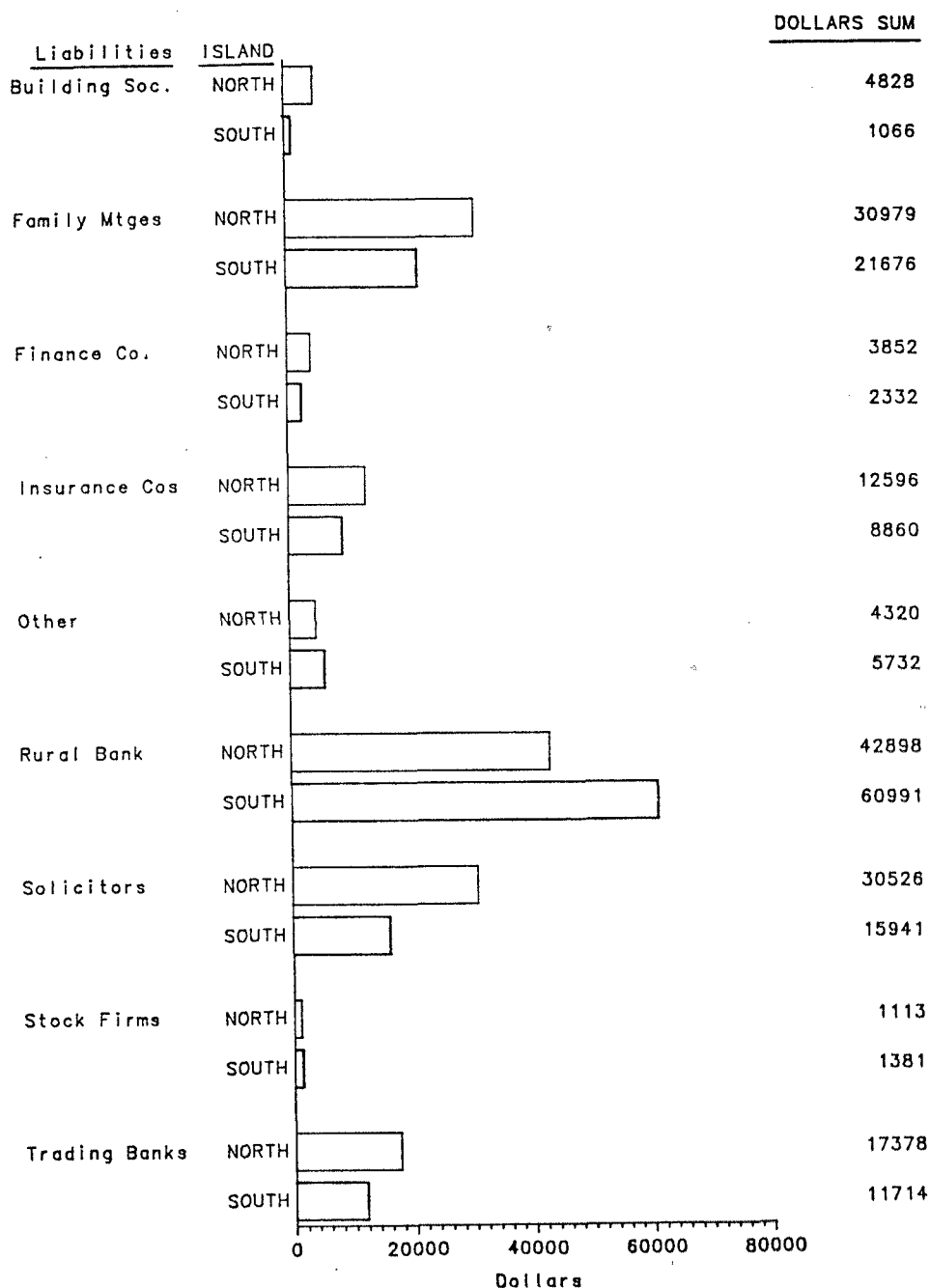
4.2.2. Value of all Liabilities

The average North Island farm of 69.05 freehold hectares had a current and fixed liabilities total of \$168,952 or \$2,205 per dairy productive hectare (see Table 18). The South Island figure was \$152,257 (\$1,735 per hectare). The New Zealand value of all liabilities decreased compared with the previous year as did the New Zealand equity value. It decreased by 13 per cent from \$6,197 to \$5,418 dairy productive hectare.

Figure 9 lists the various types of fixed liabilities for the two Islands.

FIGURE 9

Fixed Liabilities per Farm in Both Islands



4.3 Gross Revenue

4.3.1. Gross Revenue per Farm

Total gross revenue in Table 19 for the average New Zealand farm increased by eight per cent from \$1,688 per dairy productive hectare to \$1,826 per hectare. Total gross revenue per milking cow was \$1,343.

Milk sales represented 85.7 per cent of the total gross revenue for the average farm. The New Zealand figure of \$1,565 per hectare for milk sales was above the 1984-85 figure by 12 per cent. Livestock standard values were maintained at the same level as the previous survey.

The total North Island gross revenue per farm was \$152,947 or \$1,996 per dairy productive hectare. This was 25 per cent higher than the South Island total of \$1,598 per hectare. The total South Island gross revenue was \$140,243 per farm. In milk sales per cow the South Island average farm performed marginally better (at \$1,379 per cow) compared with the average North Island farm (\$1,323 per cow).

4.3.2. Types of Milk Payments Received

The average North Island farmer received \$1,148 for quota milk per dairy productive hectare (see Table 20). This was 26 per cent greater than the amount received per hectare for quota milk by South Island producers. North Island producers also received 20 per cent more payment per hectare for their surplus milk. However the South Island producers received more in special allowances, premiums and farm chilling allowances per farm.

TABLE 19

Gross Revenue Components

	North Island			South Island			New Zealand		
	Per Farm	Per Cow	Per Dairy Prod. ha	Per Farm	Per Cow	Per Dairy Prod. ha	Per Farm	Per Cow	Per Dairy Prod. ha
Total Litres Produced	522,809	4,523	6,824	506,105	4,975	5,768	516,188	4,688	6,371
Cows in Milk in Dec. 1985	115.60			101.72			110.10		
Dairy Prod. Hectares	76.61			87.75			81.02		
	\$	\$	\$	\$	\$	\$	\$	\$	\$
Milk Sales	131,401	1,137	1,715	119,672	1,176	1,364	126,753	1,151	1,565
Produce Sold	875	8	11	2,211	22	25	1,404	13	17
Wool and Skins Sold	414	3	5	501	5	6	448	4	6
Contracting Fees	772	7	10	1,337	13	15	996	9	12
Rent and Lease Fees	881	8	12	487	5	5	725	7	9
Employee's House	411	3	5	535	5	6	461	4	6
Livestock Profit									
- Dairy	14,213	123	186	12,177	120	139	13,407	122	165
- Other Stock	1,213	10	16	773	8	9	1,039	9	13
Other Revenue	2,767	24	36	2,550	25	29	2,681	24	33
Gross Revenue	152,947	1,323	1,996	140,243	1,379	1,598	147,914	1,343	1,826

TABLE 20
Types of Milk Payments Received

	North Island		South Island		New Zealand	
Number Surveyed	76		76		152	
Total Litres Produced	522,809		506,105		516,188	
Cows in Milk in December 1985	115.60		101.72		110.10	
Dairy Productive Hectares	76.61		87.75		81.02	
	Per Farm \$	Per Dairy Prod. Ha \$	Per Farm \$	Per Dairy Prod. Ha \$	Per Farm \$	Per Dairy Prod. Ha. \$
Payment Received for Milk Paid at Quota Prices	87,931	1,148	80,045	912	84,807	1,047
Payment Received for Milk Paid at Surplus Prices	28,276	369	27,043	308	27,787	343
Special Production Allowances	1,693	22	2,139	25	1,869	23
Premiums Received or Penalties Paid	142	2	315	4	210	3
Farm Chilling Allowances	121	1	203	2	154	2
End of Season, Retrospective and Other Payments	13,238	173	9,927	113	11,926	147
Total Milk Payments Received	131,401	1,715	119,672	1,364	126,753	1,565

4.4 Expenditure

4.4.1. Farm Expenditure

For the average New Zealand farm, total expenditure increased from \$1,311 per dairy productive hectare (1984-85) to \$1,413 per hectare, an increase of 8 per cent (Table 21). The largest sector percentage increase per hectare was overhead expenses which rose 16 per cent followed by labour, administration, and operation expenses.

Among the operating expenses for the average New Zealand town milk farm large rises per hectare were recorded for contractors (up 42 per cent to \$42 per hectare), electricity expenses (up 25 per cent to \$35 per hectare or \$26 per cow), and grazing expenses (up 17 per cent to \$27 per hectare). Reductions were recorded for weed and pest expenses and irrigation. The largest of all individual expenses per cow were interest (\$176 per cow), followed by repairs and maintenance (\$116) and vehicle expenses (\$89 per cow).

Farm Expenditure Components

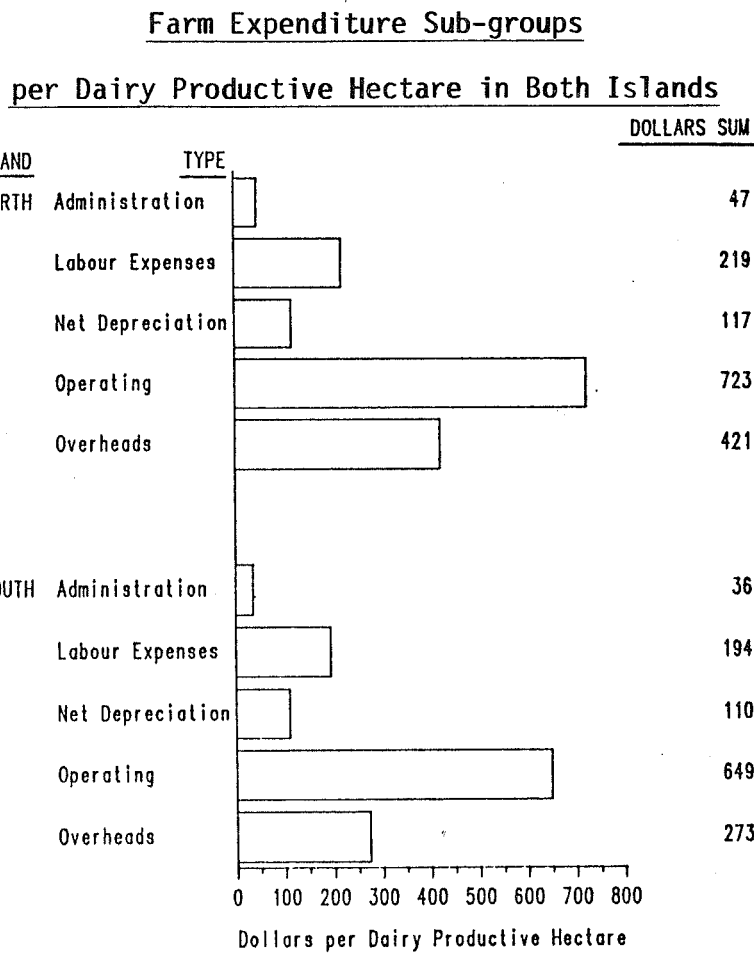
	North Island			South Island			New Zealand		
	Per Farm	Per Dec. Cows	Per Dairy Prod. ha.	Per Farm	Per Dec. Cows	Per Dairy Prod. ha	Per Farm	Per Dec Cow	Per Dairy Prod. ha.
Total Litres Produced	522,809	4,523	6,824	506,105	4,975	5,768	516,188	4,688	6,371
Cows in Milk in Dec.'85	115.60			101.72			110.10		
Dairy Prod. Hectares	76.61			87.75			81.02		
<u>Labour</u>	\$	\$	\$	\$	\$	\$	\$	\$	\$
Family Labour	2,219	19	29	3,739	37	42	2,821	25	35
Family Casual Labour	468	4	6	611	6	7	524	5	7
Non-Family Permanent & Casual Labour	10,231	88	133	7,709	76	88	9,232	84	114
Unpaid Family Labour	3,441	30	45	4,446	44	51	3,839	35	47
Labour Accommodation	439	4	6	532	5	6	476	4	6
Sub-Total Labour	16,798	145	219	17,037	168	194	16,892	153	209
<u>Operating</u>									
Animal Health	3,708	32	49	3,201	31	36	3,507	32	43
Breeding & Herd Testing	1,852	16	24	2,071	20	24	1,939	18	24
Contractors	2,431	21	32	3,337	33	38	2,790	25	34
Dairy Shed Expenses	2,702	23	35	2,575	25	29	2,652	24	33
Electricity	2,756	24	36	2,934	29	33	2,826	26	35
Fertiliser & Seed	9,417	82	123	6,829	67	78	8,392	76	104
Feed	5,920	51	77	8,934	88	102	7,113	65	88
Grazing Expenses	3,151	27	41	707	7	8	2,183	20	27
Freight	712	6	9	1,008	10	11	829	7	10
Weed & Pest Expenses	874	8	12	764	8	9	830	8	10
Vehicle Expenses	9,259	80	121	10,701	105	122	9,830	89	121
Repairs & Maintenance	12,490	108	163	13,221	130	151	12,780	116	158
Irrigation Expenses	97	1	1	702	7	8	337	3	4
Sub-total Operating	55,369	479	723	56,984	560	649	56,008	509	691

Table 21 continued ...

TABLE 21 (continued ...)
Farm Expenditure Components

	North Island			South Island			New Zealand		
	Per Farm	Per Dec. Cows	Per Dairy Prod. ha.	Per Farm	Per Dec. Cows	Per Dairy Prod. ha	Per Farm	Per Dec Cow	Per Dairy Prod. ha.
	\$	\$	\$	\$	\$	\$	\$	\$	\$
<u>Administration</u>									
Accountancy	1,278	11	17	1,100	11	12	1,207	11	15
Telephone	697	6	9	611	6	7	663	6	8
General Administration	1,662	14	21	1,479	14	17	1,590	14	20
Sub-total Administration	3,637	31	47	3,190	31	36	3,460	31	43
<u>Overheads</u>									
Insurance	1,886	16	25	2,343	23	27	2,068	19	26
Interest	21,446	186	280	16,388	161	187	19,442	176	240
Rates	3,125	27	41	2,646	26	30	2,935	27	36
Rent	5,762	50	75	2,556	25	29	4,491	41	55
Sub-total Overheads	32,219	279	421	23,933	235	273	28,936	263	357
Total Cash Expenses	108,023	934	1,410	101,144	994	1,152	105,296	956	1,300
Net Depreciation	8,948	78	117	9,620	95	110	9,214	84	113
Total Expenditure	116,971	1,012	1,527	110,764	1,089	1,262	114,510	1,040	1,413

FIGURE 10



Comparing the per cow results from the two Islands, the North Island farmer spent more on grazing, non-family labour, fertilizer and seed, rent and interest. North Island grazing expenses (at \$27 per cow) were nearly four times greater than the South Island result per cow (\$7). Non-family labour expenses in the North Island were 16 per cent higher per cow (\$88 compared with \$76 in the South). Fertilizer and seed expenses (\$82 per cow) were 22 per cent higher in the North. Rent at \$50 per cow was 100 per cent higher than in the South.

In the South Island the major percentage cost differences per cow were irrigation (seven dollars per cow compared with one dollar), family labour (95 per cent higher), feed costs (73 per cent above the North Island at \$88 per cow), contracting (57 per cent higher), and freight (67 per cent greater at \$10 per cow). Other South Island costs with large percentage differences per cow were insurance (up 44 per cent), vehicle expenses (up 31 per cent), and depreciation (at \$95 per cow or 22 per cent higher than the North Island per cow result). Operating expenses per milking cow are compared between the two Islands in Figure 12.

For both Islands the largest cost items per productive hectare were interest followed by repairs and maintenance, non-family labour, fertiliser and seed, vehicle expenses, depreciation, and feed. The biggest cost was interest at \$280 per hectare in the North and \$187 per hectare in the South - a 50 per cent difference, followed by repairs and maintenance (\$163 and \$151 per hectare - an eight per cent difference), non-family labour (\$133 and \$88 - a 51 per cent difference), fertiliser and seed (\$123 and \$78 per hectare - 58 per cent difference), vehicle expenses (\$121 and \$122 per hectare - almost no difference) and depreciation (\$117 per hectare in the North Island and \$110 per hectare in the South - a six per cent difference).

Expenditure per December milking cow for the past five surveys is listed in Figure 11.

FIGURE 11

Five Years Expenditure per December Milking Cow

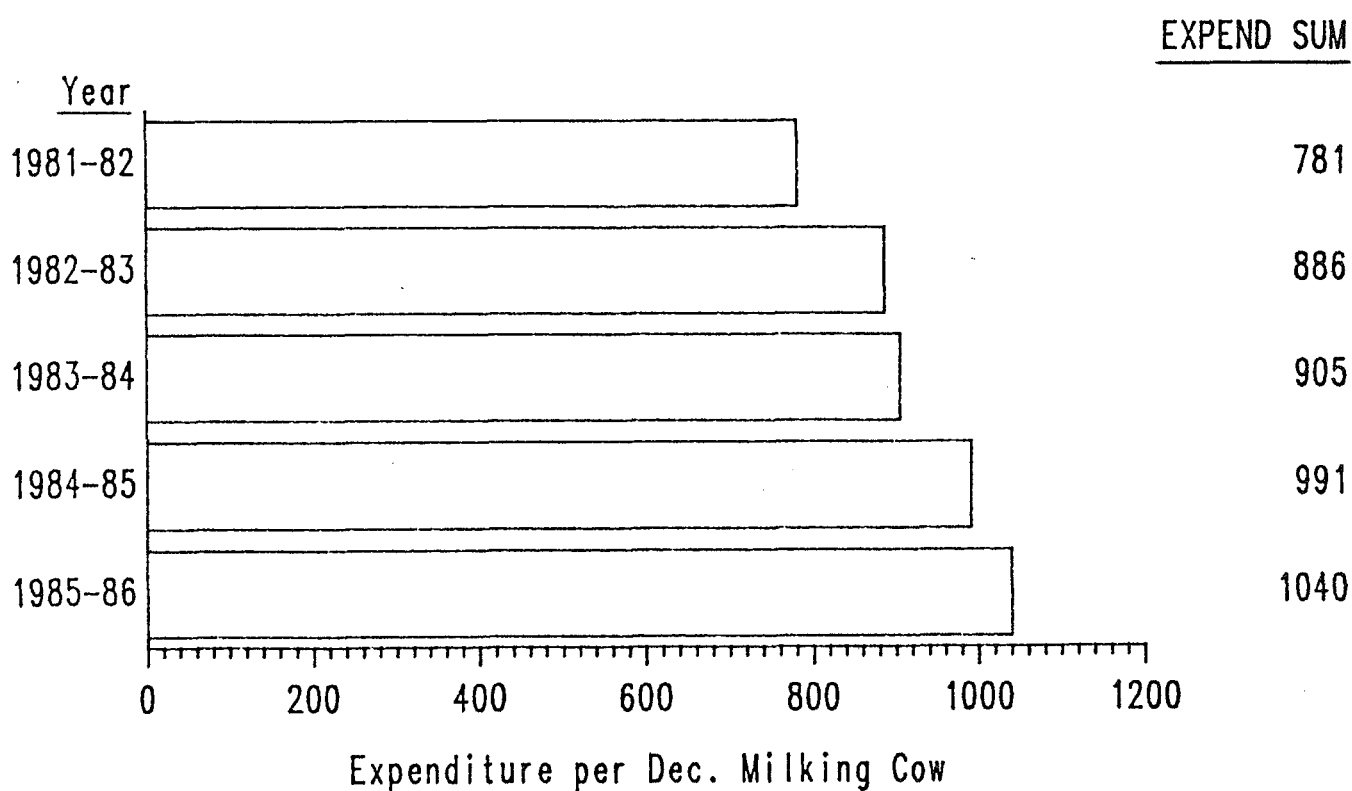
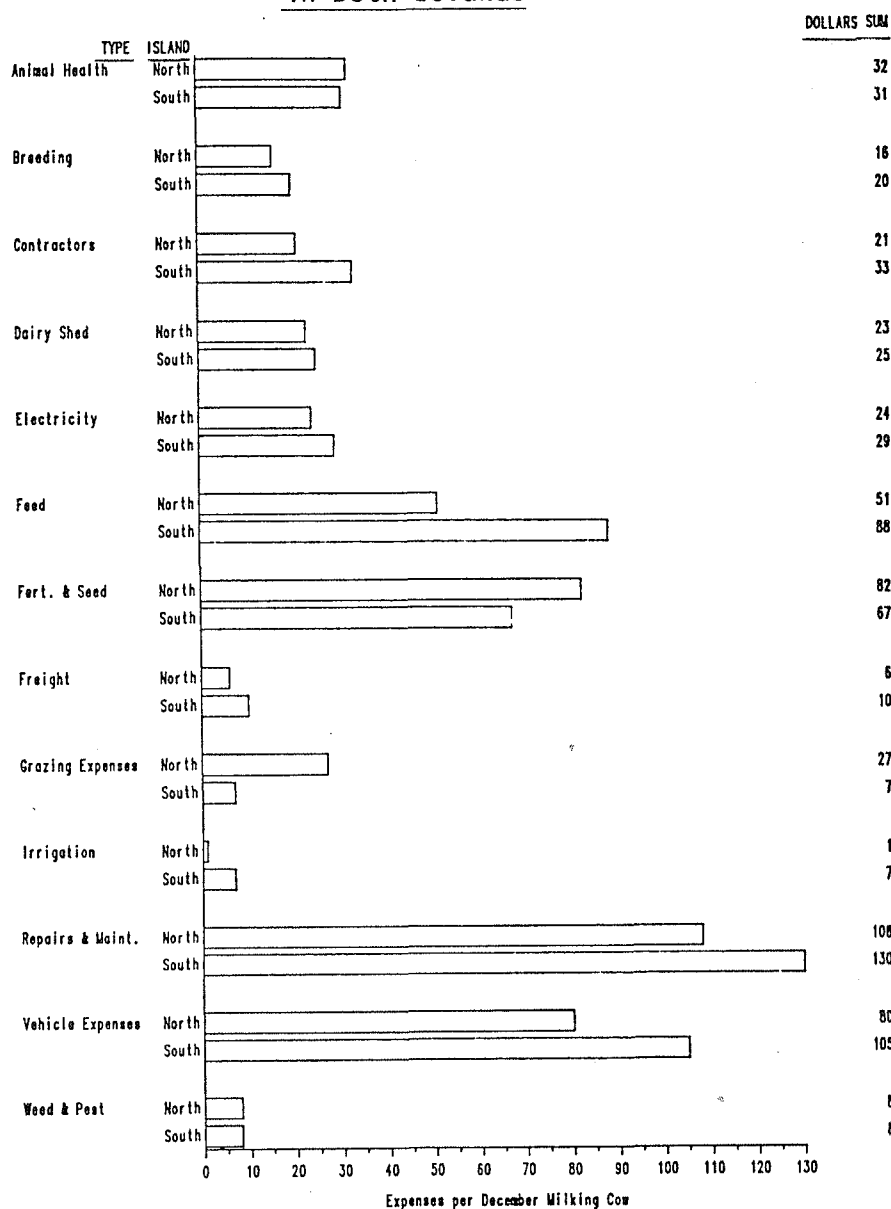


FIGURE 12

Operating Expenses per December Milking Cowin Both Islands4.4.2. Depreciation of Farm Assets

Net depreciation (Table 22) fell by 15 per cent compared with the previous survey year from \$10,558 to \$9,214 for the average New Zealand farm. The fall was greater in the North Island (down by 18 per cent) compared with the South Island (down by 10 per cent).

Total gross depreciation for New Zealand fell by 16 per cent to \$9,948 compared with the previous 1984-85 year. The average North Island farm had a decrease of 22 per cent with the South Island average farm showing a smaller fall of 9 per cent. Gross depreciation results for the two Islands are compared in Figure 13.

TABLE 22
Depreciation of Farm Assets

	North Island	South Island	New Zealand
Number Surveyed	76	76	152
Total Litres Produced	522,809	506,105	516,188
Cows in Milk in December 1985	115.60	101.72	110.10
Dairy Productive Hectares	76.61	87.75	81.02
	\$	\$	\$
Farm Buildings	2,388	2,217	2,320
Plant & Equipment	2,161	2,798	2,413
Farm Vehicles	5,092	5,401	5,215
Gross Depreciation	9,641	10,416	9,948
Less Personal Car Depreciation	427	385	411
Less Depreciation Recovered	266	411	323
Net Depreciation	8,948	9,620	9,214
Cost of New Assets	17,845	19,896	18,656

4.5 Farm Income

4.5.1. Net Farm Income

New Zealand net farm income (before taxation) averaged \$33,403 in 1985-86 on a 81.02 dairy productive hectare area. This was 4.5 per cent higher than the previous years per farm result of \$31,960 (84.75 dairy productive hectares). The net farm income per dairy productive hectare for 1985-86 was \$412 per hectare and this was nine per cent up on the previous year (\$377 per hectare). Two years before in 1984-85 the net farm income per hectare for the average New Zealand farm had been \$319 per hectare. (See Figure 15).

In Figure 14 details of gross revenue and net farm income per dairy productive hectare are drawn for the two Islands.

The New Zealand net farm income per December milking cow was \$303. The North Island result (\$311 per cow) was seven per cent higher than in the South (\$290 per cow). This difference was due to the higher expenses per cow in the South. Revenue per cow in both Islands was 4.2 per cent different (\$1,323 and \$1,379 per cow) but expenditure in the South Island was 7.6 per cent greater (at \$1,089 compared with \$1,012 per cow in the North). Survey results from five years net farm income per December milking cow are detailed in Figure 16.

In the North Island total net farm income (for a 76.61 productive hectare farm) was \$35,976. This was 5.6 per cent less than the previous year (82.72 productive hectare area). The increase in the South Island was more substantial (30 per cent). The average South Island 87.75 productive hectare farm had a net farm income of \$29,480. In the previous year a similar average sized farm (87.88 hectares) had an income of \$22,704.

FIGURE 13
Gross Depreciation of Farm Assets in Both Islands

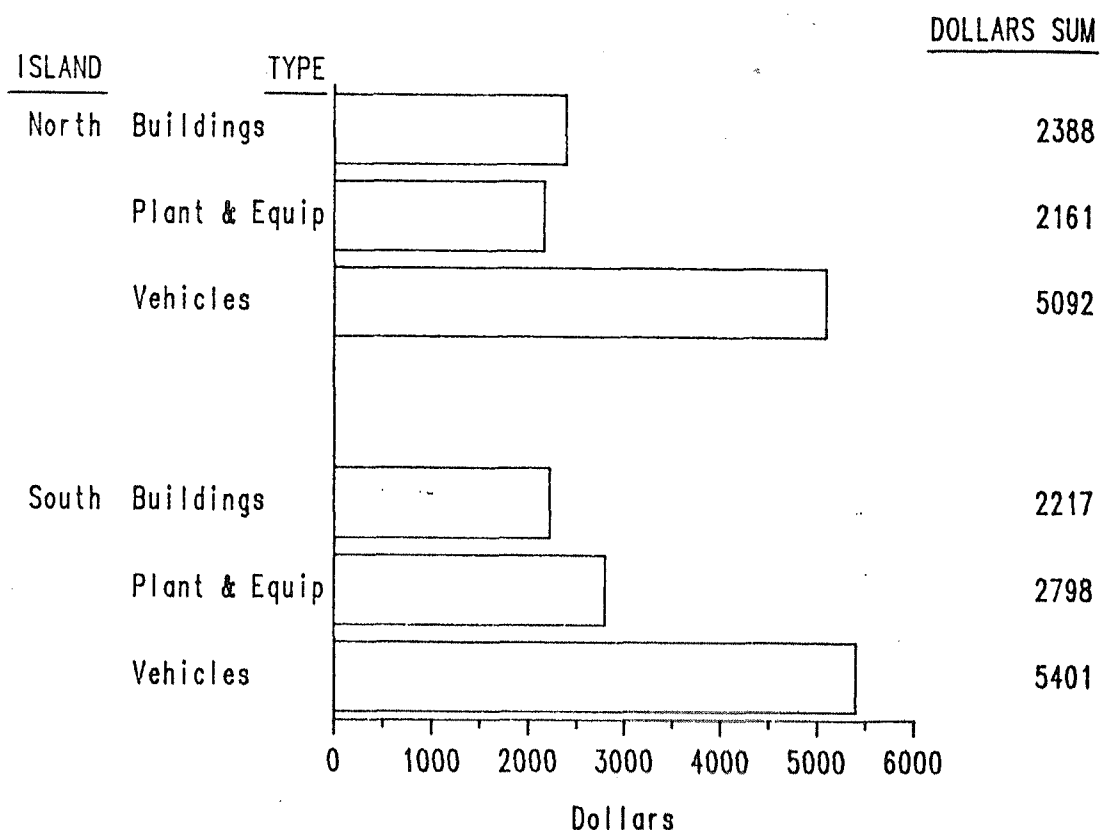


TABLE 23
Net Farm Income Components

	<u>North Island</u>			<u>South Island</u>			<u>New Zealand</u>		
	Per Farm	Per Dec. Cows	Per Dairy Prod. ha.	Per Farm	Per Dec. Cows	Per Dairy Prod. ha.	Per Farm	Per Dec. Cow	Per Dairy Prod. ha.
Total Litres Produced Cows in Milk in Dec. 1985	522,809	4,523	6,824	506,105	4,975	5,768	516,188	4,688	6,371
Dairy Prod. Hectares	115.60			101.72			110.10		
	76.61			87.75			81.02		
	\$	\$	\$	\$	\$	\$	\$	\$	\$
Gross Revenue	152,947	1,323	1,996	140,244	1,379	1,598	147,913	1,343	1,825
Total Expenditure	116,971	1,012	1,527	110,764	1,089	1,262	114,510	1,040	1,413
Net Farm Income	35,976	311	469	29,480	290	336	33,403	303	412

FIGURE 14

Net Farm Income Components
per Dairy Productive Hectare in Both Islands

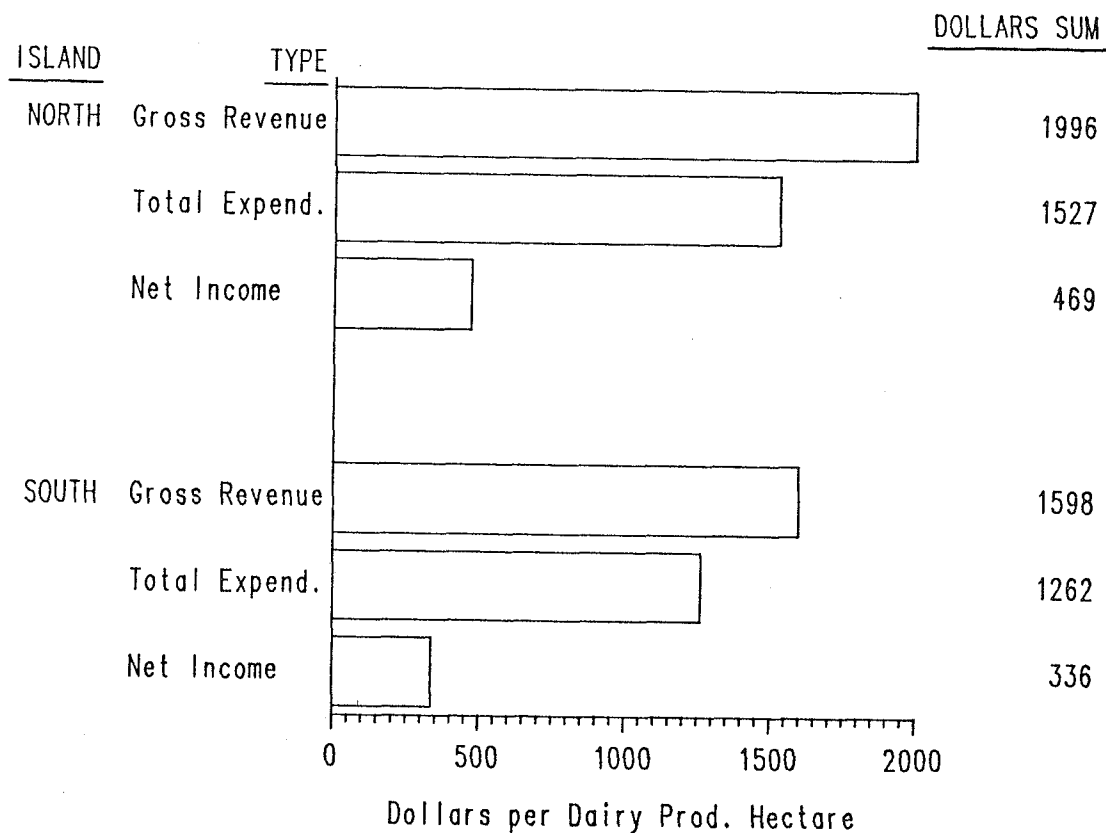


FIGURE 15

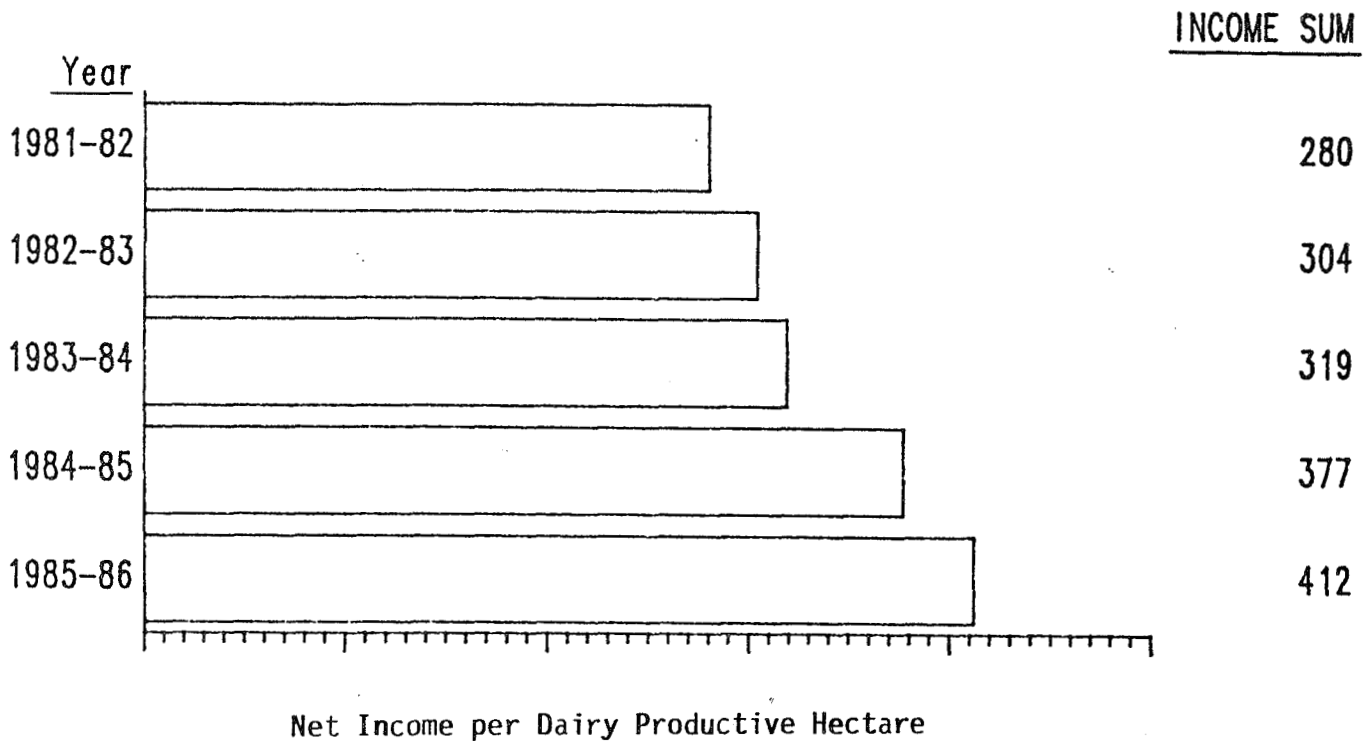
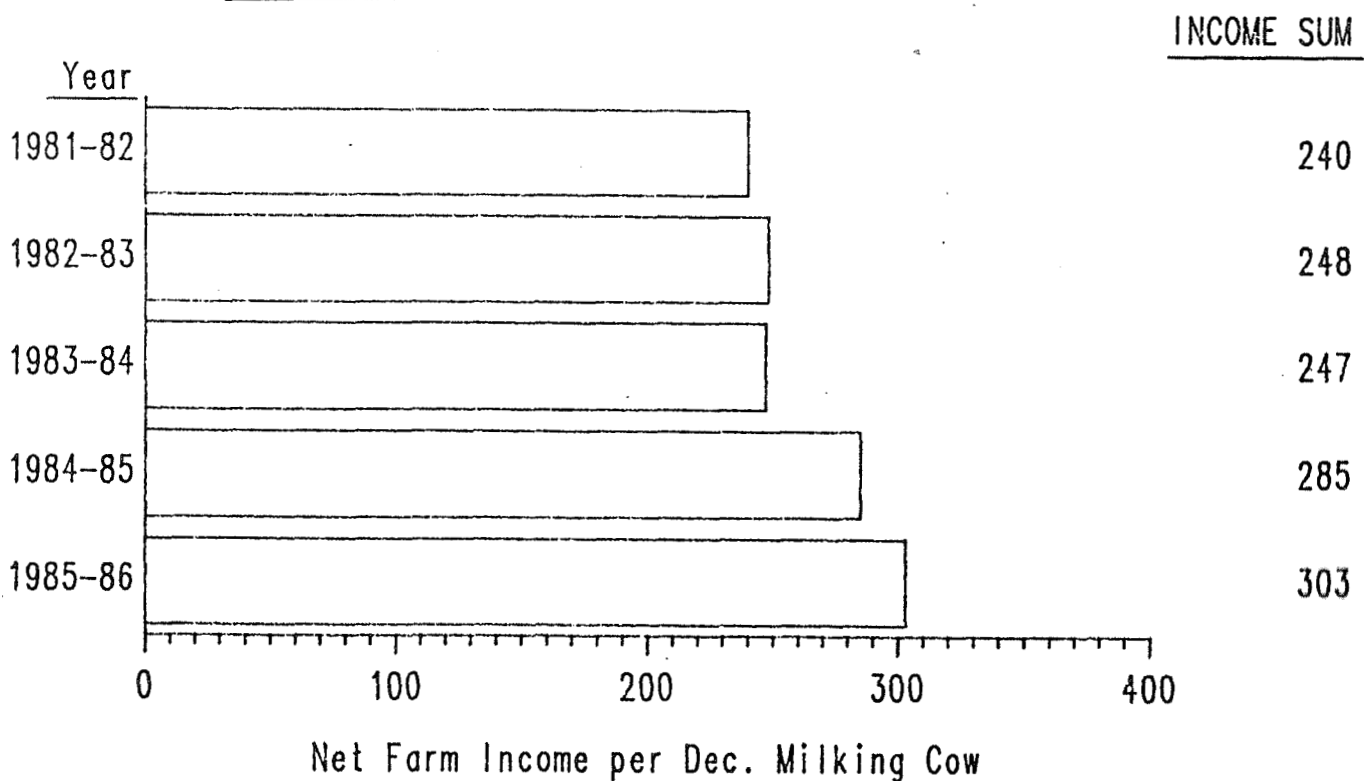
Five Years Net Farm Income per Dairy Productive Hectare

FIGURE 16

Five Years Net Farm Income per December Milking Cow

4.5.2. Cash Surplus

Details of the cash surplus available to farmers after the year's farming are listed in Table 24. Imputed revenue and cost components such as allowances for the employee's house and family labour are excluded. Taxation has not been deducted.

Cash surplus from farming fell slightly to \$44,225. This was less than the previous survey results (\$45,060). The North Island result decreased from \$51,053 to \$45,507. The South Island increased from \$35,847 to \$42,271.

Cash receipts for the average New Zealand farm were up by two per cent with cash expenses increasing by 3.6 per cent. In the North Island cash received fell marginally but cash spent rose by 4.5 per cent. In the South both cash received and cash spent increased (the former by 2.3 per cent and the latter by 6.5 per cent).

Dairy cattle sale receipts showed a decrease over the previous year. For the average New Zealand farm, dairy cattle sales decreased from \$16,652 to \$12,392.

4.5.3. Farm Incomes Less Imputed Interest Rates

In Table 25 an imputed interest rate (eg. 3.5 per cent) was applied first to the equity of the farmer. The resulting figure was then deducted from the net farm income. The actual interest paid was left in as an expense.

Similarly an imputed interest was applied to the total value of farm assets. The resulting figure was then deducted from the sum of net farm income plus actual interest paid. This second approach eliminates any differences that occurred in net farm incomes due to actual interest payments and assumes that the farms were debt free.

TABLE 24
Cash Surplus from Farming
(\$ per Farm)

	North Island	South Island	New Zealand
Number Surveyed	76	76	152
Total Litres Produced	522,809	506,105	516,188
Cows in Milk in December 1985	115.60	101.72	110.10
Dairy Productive Hectares	76.61	87.75	81.02
	\$	\$	\$
<u>1. Cash Received</u>			
Milk Sales	131,401	119,672	126,753
Dairy Cattle Sales	12,228	12,642	12,392
Sheep and Beef Sales	170	832	432
Bobby Calf Sales	3,554	3,028	3,346
Other Farm Income	5,708	7,086	6,254
Total Received	153,061	143,260	149,177
<u>2. Cash Spent</u>			
Labour and Operating	68,286	69,043	68,584
Overhead and Admin.	35,856	27,123	32,396
Dairy Purchases	3,087	4,416	3,614
Sheep and Beef Cattle Purchases	325	407	358
Total Spent	107,554	100,989	104,952
Cash Surplus from Farming	45,507	42,271	44,225

TABLE 25

Net Farm Income Less Imputed Interest on Equity and
Total Assets

	North Island	South Island	New Zealand
Number Surveyed	76	76	152
Total Litres Produced	522,809	506,105	516,188
Cows in Milk in December 1985	115.60	101.72	110.10
Dairy Productive Hectares	76.61	87.75	81.02
	\$	\$	\$
Equity	495,708	352,546	439,005
Net Farm Income	35,976	29,480	33,403
A. Net Farm Income less Imputed Interest on Equity at Rate of: 3.5%	18,626	17,141	18,038
5%	11,191	11,853	11,453
7%	1,276	4,802	2,673
Total Farm Assets	645,301	478,275	579,140
Net Farm Income	35,976	29,480	33,403
Interest Paid	21,446	16,388	19,442
B. Net Farm Income less Imputed Interest on Total Farm Assets at Rate of: 3.5%	34,836	29,128	32,575
5%	25,157	21,954	23,888
7%	12,251	12,389	12,305

4.5.4. Measures of Economic Profitability ⁶

An attempt has been made in Table 26 to allow a comparison of results from this town milk survey with the results published in the NZ Meat and Wool Board's Economic Service Survey of sheep and beef farms. Most of the terms used here are particular to this table and are not found elsewhere in this report. They are defined in Appendix B.

The calculated rate of return on farm capital invested for the average New Zealand town milk farm was 4.96 per cent (Table 26). The North Island return was 4.94 per cent and the South Island 4.99 per cent (See Figure 17).

The capital turnover percentage is the ratio of gross revenue (less worker's house) to total farm capital expressed as a percentage. In 1985-86 the average New Zealand farm had a capital turnover percentage of 20.33 per cent.

The labour and management residual is an assessment of what the farmer earns as a reward for his own labour and management, given that he pays interest at 12.0 per cent on his own equity capital, in addition to the interest he already pays on borrowed capital. The New Zealand average town milk residual was - \$36,815.

4.6 Principal Revenue and Expenditure Components

Milk sales represented 86 per cent of total revenue in the current survey (Table 27). This was more than the 1984-85 survey (83 per cent).

The major expenditure sub-group was operating expenses. Operating expenses make up half the total expenses on the average town milk farm. The next major expenditure sub-group was overheads, followed by labour expenses.

As a percentage of total expenses all expenditure sub-groups for the two Islands were similar to those of 1984-85.

⁶ New Zealand Meat and Wool Board's Economic Service, Sheep & Beef Farm Survey, 1984-85 p.56.

TABLE 26

Measures of Economic Profitability

	North Island	South Island	New Zealand
Number Surveyed	76	76	152
Freehold Land Area (ha)	69.05	84.54	75.19
	\$	\$	\$
A. <u>Return on Capital</u>			
1. Working Expenses (less imputed costs)	71,923	72,232	72,044
2. Plus assessed Managerial Reward	22,399	19,820	21,377
3. Total Adjusted Working Expenses (1+2)	94,322	92,052	93,421
4. Working Capital (8.33% of 3)	7,857	7,668	7,782
Freehold, Rented and Grazing-Out Land	661,222	415,840	564,014
Buildings (less Farmer's House)	31,516	29,960	30,900
Plant & Equipment	11,986	19,936	15,135
Farm Vehicles (less Car at \$10,548)	15,393	16,786	15,945
Livestock at Market Value	97,223	82,787	91,505
5. Farm Capital	817,340	565,309	717,499
6. Total Farm Capital (4+5)	825,197	572,977	725,281
7. Net Farm Income	35,976	29,480	33,403
8. Plus Interest Paid	21,446	16,388	19,442
9. Plus Rent Paid	5,762	2,556	4,491
10. Sub-total (7+8+9)	63,184	48,424	57,336
11. Less Managerial Reward (2)	22,399	19,820	21,377
12. Economic Farm Surplus (10-11)	40,785	28,604	35,959
13. Rate of Return percentage (12/6)	4.94%	4.99%	4.96%

(Table 26 continued ...)

TABLE 26 continued

Measure of Economic Profitability ^a

	North Island	South Island	New Zealand
<hr/>			
B. <u>Capital Turnover Percentage</u>			
	\$	\$	\$
14. Gross Revenue (less Worker's house)	152,535	139,708	147,452
15. Total Farm Capital (6)	825,197	572,977	725,281
16. Capital Turnover Percentage (14/15)	18.48%	24.38%	20.33%
<hr/>			
C. <u>Labour & Management Resources</u>			
17. Total Farm Capital (6)	825,197	572,977	725,281
18. Plus Cash at Bank, Sundry Debtors & Other Current Assets	19,359	26,528	22,200
19. Sub-total (17+18)	844,556	599,505	747,481
20. Less Fixed Liabilities	148,490	129,694	141,042
21. Less Current Liabilities	20,462	22,564	21,293
22. Total Equity Capital (19-20-21)	675,604	447,247	585,146
23. Net Farm Income (7)	35,976	29,480	33,403
24. Less 12.0% of Equity Capital (22)	81,073	53,670	70,218
25. Labour & Management Residual (23-24)	-45,097	-24,190	-36,815
<hr/>			

^a Most of the terms used in this table are particular to this table alone; they are defined in Appendix B.

FIGURE 17

Two Measures of Economic Profitability
in Both Islands

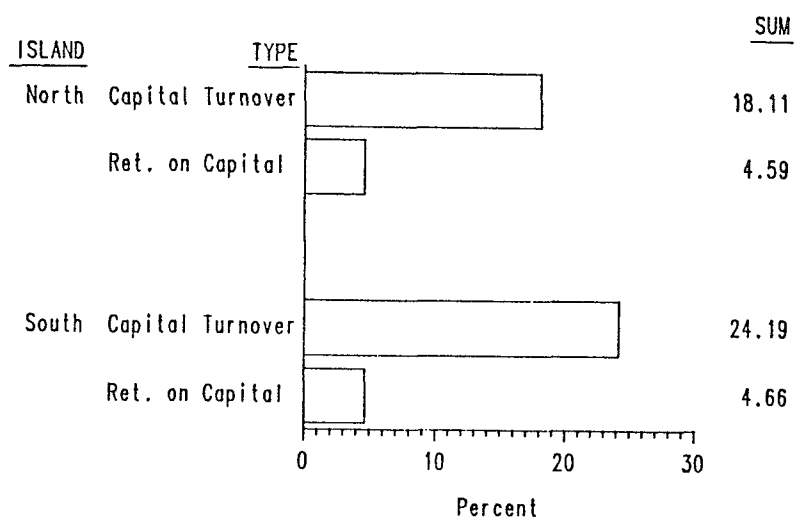


TABLE 27

Revenue and Expenditure Proportions

	North Island	South Island	New Zealand
Number of Farms	76	76	152
	%	%	%
Gross Revenue			
Milk Sales	86	85	86
Livestock Profit	10	9	10
Other Revenue	4	6	4
Total Revenue Percentage	100	100	100
Expenditure			
Labour	14	15	15
Operating	47	51	49
Administration	3	3	3
Overheads	28	22	25
Depreciation	8	9	8
Total Expenditure Percentage	100	100	100
Expenditure/Revenue Ratio	76	79	77

APPENDIX A

PRODUCER ASSOCIATIONS INCLUDED IN SURVEY

NORTH ISLAND

Bay of Islands Co-op Milk Producers' Ltd
Whangarei Milk Producers Ltd
North Shore Co-op Milk Producers Ltd
Auckland Co-op Milk Producers Ltd
The New Zealand Co-op Dairy Co. Ltd, Auckland
Franklin Co-op Milk Producers Ltd
Thames Valley Milk Producers Ltd
Hamilton Milk Producers Co. Ltd
Western Bay of Plenty (Co-op) Milk Producers Ltd, Tauranga
Eastern Bay of Plenty (Co-op) Milk Producers Ltd, Whakatane
Rotorua Co-op Milk Producers Co. Ltd
Tokoroa Co-op Milk Producers Co. Ltd
Gisborne Co-op Milk Producers Assn Ltd
Hawkes Bay Milk Producers Co-op Ltd
New Plymouth Town Milk Co-op Ltd
Egmont Town Milk Co-op Ltd
Wanganui Co-op Milk Supply Co. Ltd
Manawatu Co-op Milk Producers Co. Ltd
Wairarapa Town Milk Ltd
Wellington Dairy Farmers Co-op Assn Ltd

SOUTH ISLAND

Nelson Co-op Milk Producers Assn Ltd
Blenheim Co-op Milk Supply Co. Ltd
Buller Co-op Milk Producers Assn Ltd
Grey District Co-op Milk Producers Assn Ltd
Canterbury Dairy Farmers Ltd
Metropolitan Milk (ChCh) Ltd
Ashburton Town Milk Producers Co-op Co. Ltd
South Canterbury Co-op Milk Supply Co. Ltd, Timaru
North Otago Co-op Milk Supply Co. Ltd, Oamaru
Dairy Farmers Co-op Milk Supply Co. Ltd, Dunedin
Southland Co-op Milk Producers Ltd, Invercargill

APPENDIX B

SURVEY DEFINITIONS AND TREATMENT OF DATA

The same basic survey principles and procedures have been adopted as in surveys of previous years. The following definitions and principles were adopted in extracting data from each farm.

FARM AREA:

Total Farm Area

This was the total area farmed by the producer during his 1985-86 financial year. It included rented land and run-off units, but did not include any 'grazing out' land.

Productive Farm Area

The productive area of the farm included the land to which stock had regular access. It was the area grazed by stock, less the area in roads, yards, races and farm buildings. The productive area of run-off units was also included. Areas under swamp, steep gullies, riverbeds and dense bush were excluded.

Productive Farm Area Used for Dairy Stock

This was the estimated total productive area of land used for pasture and fodder production for dairy stock grazing during the income year. Estimated areas used for beef cattle and sheep grazing have been deducted. All grazing out areas used by farmers during the year have been converted to an annual grazing area and are included in the estimated area.

Run-Off Units

Run-off units were land areas separated from the main farm and were mainly used to rear young dairy stock or carry other stock from time to time. Run-off units were included in the total farm area.

LABOUR

Labour Units

A labour unit was defined as a worker, whether owner or employee, who worked on the farm full time over the survey period. Fractional units of labour were used when including work carried out on a part year or part time basis. Any work carried out by children under 12 years was ignored. The farmer's spouse, cadet and student workers were assessed according to the amount of useful work carried out.

QUOTA

This was the average daily quota per farm for the farmer's 1985-86 financial year.

MILK GRADES

Milk grades are defined by the N.Z. Milk Board as follows:

Finest Grade: For milk which passes a five-hour reductase test and which, while generally complying with the accepted national standard of 4.3 per cent fat for town milk, does not fall below 3.5 per cent fat.

First Grade: For milk which passes a three-hour reductase test but fails to pass the five-hour test and /or which contains 3.25 per cent fat but not 3.5 per cent fat.

Second Grade: For milk which fails to pass a three-hour reductase test and/or contains less than 3.25 per cent fat.

REVENUETotal Milk Sales

The value of all milk sales was extracted from each set of accounts and checked against the monthly milk payments as provided by each producers company. Milk receipts include all relevant special payments made by the producer company during the farm's financial year.

Produce Sold

Proceeds from the sale of other farm produce, e.g. cereals, hay etc.

Contracting Fees

Gross proceeds from contracting work undertaken by the farmer or his employees e.g. fencing, haybaling, bulldozing etc.

Rent and Lease Fees

Grazing fees or rent received from farm cottages or land.

Employee's House and Produce

This value is the sum of the annual imputed rental of \$1,560 for the farm employee's house and \$190 per annum allowance for each married non-family permanent worker for produce used. The figure of \$190 per annum for produce used per full-time married labour unit was adopted to cover milk, meat, vegetables and firewood used. This allowance was not extended to the owner or members of the farm family. The value of produce used was also included in labour accommodation expenses.

Livestock Profit

Stock profit from the livestock trading accounts. The survey standard values were applied to all livestock. Stock balances were derived with the aid of the farmer and farm accounts.

Other Revenue

Sales of timber, posts, and sundry items, and interest from Dairy Company shares and investments. Government livestock subsidies and drought relief payments are also included.

Gross Revenue

Sum of all the above income items. Non-farm income has not been assessed in the survey.

EXPENDITURE

Family Permanent Labour

Actual wages paid to permanent family members. It does not include any salary or management fee paid to owner.

Value of Labour Unit

A standard wage of \$13,145 per annum, with the provision of a house, was assumed for the imputed wage of adult workers over 20 years. This figure was based on the adult award wage for dairy farm workers from 1 September 1985 of \$8,978 per annum. A further \$4,167 was added to compensate for the 12 months milking requirement on a town-milk farm and the proximity of alternative employment opportunities. The imputed wage based on a 54 hour week for youths between 12 and 20 years of age was the award rate for 18 year olds of \$7,371 per annum. The mean New Zealand adult annual wage paid on surveyed town milk farms in 1984-85 was \$11,519.

Non-Family Permanent and Casual Labour

Wages paid to permanent and casual non-family members. Casual wages include wages paid for relief milking, casual feeding, haymaking etc. during the year. Contractors' work is excluded.

Unpaid Family Labour

The value of unpaid family labour was assessed as follows:

Adults over 20 years of age	\$4.68 per hour
12-20 year old youths and girls	\$2.63 per hour
Children under 12 years	Nil

The time worked by family members up to a maximum of 54 hours per week was assessed and an imputed total wage calculated. If a wage was paid and listed in the accounts, this was noted under family labour and deducted from the assessed total. Any balance was listed as unpaid family labour. If two brothers worked full-time as a partnership, the farm was adjusted to a sole ownership enterprise and one brother was allocated an imputed wage of \$13,145 per annum.

Labour Accommodation

This was calculated as the sum of the imputed rental value of the farm cottage of \$1,560 per annum and \$190 per annum for produce used by non-family permanent workers. Full board was assessed at \$1,000 per year per person.

Contracting

Payment to contractors for work done, such as bulldozing, fencing, cultivation, hay or silage making and harvesting.

Animal Health

This amount includes all veterinary fees and drugs, bloat control and facial eczema control.

Breeding and Herd Testing

Artificial breeding, herd testing and pedigree expenses.

Shed Expenses

Rubberware, ropes, buckets, cleansers and miscellaneous items for sheds. Rebates have been deducted where applicable.

Electricity

Electricity used on the farm and up to one-quarter of the domestic account.

Fertiliser and Seed

Includes cost of fertiliser, seeds and spreading charges. Subsidies and rebates have been deducted.

Feed

Purchases of hay, straw, dairying meal, grains, minerals, calf food and miscellaneous items such as baler twine. Rebates were deducted where applicable.

Grazing Expenses

Grazing fees incurred during the year.

Weed and Pest Control

This amount includes cost of materials and spraying work. In some cases where it is not itemised the cost of spraying work is included in contracting expenses.

Vehicle Expenses

Includes fuel, repairs, licences, registration, insurance and so on for all vehicles including farm bikes. Personal allowances for vehicle running have been deducted where they were shown in accounts.

Repairs and Maintenance

Repairs to buildings, plant, fences, water supply, races etc. This item also includes 25 per cent of repairs to the farmer's house.

Development Expenses

If this amount is detailed in the farmer's accounts, it has been combined with Repairs and Maintenance in the results.

Irrigation Expenses

Repairs to irrigation equipment and running costs for fuel or electricity.

Accountancy

Accountancy fees paid on all farm accounts.

Telephone

Telephone rentals and tolls.

General Administration

Administration items not allocated elsewhere, e.g. farm advisory services, legal fees, subscriptions, travelling expenses and sundry other administration items.

Insurance

General insurance of farm assets.

Interest

The interest paid is that listed in the accounts. It does not include any calculated interest on the farmer's equity capital.

Rates

The amounts paid to County Council, Harbour Board, Catchment Board, Rabbit Board or Drainage Board.

Rent

Fees paid for Crown lease or other renting. Excludes all internal rents paid to family trusts and companies etc.

Depreciation of Farm Buildings

The original cost values of all farm buildings were used to determine depreciation. Ordinary building depreciation rates as

claimed for tax purposes were applied. The normal taxation depreciation rate was applied to the cost values of all houses on the farm.

Depreciation of Other Assets

Depreciation on all other assets except farm buildings was also based on rates used for taxation purposes. All personal allowances for depreciation (eg motor car) were deducted from the gross depreciation.

Net Depreciation

Includes all special and ordinary depreciation as claimed for tax purposes plus any loss on sale of an asset and less any profit on sale of an asset.

Total Farm Expenditure

Sum of all the above expenditure items.

Net Farm Income

Gross farm revenue less total farm expenditure.

Cash Surplus from Farming

This is the difference between the cash received and the cash spent. Imputed revenue and cost components such as allowances for the employee's house and family labour are excluded. Taxation has not been deducted.

CAPITAL STRUCTURE - ASSETS

Freehold Land

The most recent Government capital valuation for each farm was obtained from the farmer. This was then updated to December 1985 using the New Zealand All Farmland Price Index published by the Valuation Department. Next, the opening book value of each farmer's buildings was subtracted to arrive at the updated land value.

Land Value Indices

Year Ended 31 Dec.	N.Z. Farmland Price Index (June 1980 = 1,000)	Updating Factor
1981	1,531	1.3650
1982	2,014	1.0377
1983	2,005	1.0424
1984	2,095	0.9976
1985	2,090	1.0

Report of the Valuation Department for the year ended 31 March 1986, p.8.

Farmer's House

Half the average book value of the farmer's house is included.

Dairy and Other Stock

Numbers of dairy and other stock in the various classes were determined partly from the farm accounts and partly from discussions with the farmer. The following standard values per head were applied to the various classes of stock:

Dairy Stock

All Cows	\$125	Young Bulls	\$50
Heifers-in-calf	\$100	Bulls	\$200
Heifer	\$80		
Yearlings	\$50		
Calves	\$20		

Sheep

Ewes	\$10	Wethers	\$8
Hoggets - Ewe	\$10	Rams	\$30
- Ram	\$8		
- Wether	\$8		

Beef Cattle

Cows	\$125	Steers - calves	\$50
Heifer - calves	\$50	- 1 year	\$50
- 1 year	\$50	- 2 year	\$125
- 2 year	\$125	Bulls - calves	\$50
		- other	\$200

In order to allow comparisons of results with previous surveys the standard values applied to all stock were the same as for the previous two surveys.

Cash at Bank

Average value of all current accounts held at banks for the farm's financial year.

Sundry Debtors

Average value of general sundry debts to the farm account. Most of this amount is monthly milk payments due from the Producer companies.

Other Current Assets

The sum of all current and long term farm assets.

CAPITAL STRUCTURE - LIABILITIES

Current Liabilities

The average balance taken from the farmer's balance sheets for the various current liabilities.

Fixed Liabilities

The average balance for all the fixed liabilities such as mortgages and long term loans.

Equity

This value is obtained by subtracting the value of total current and fixed liabilities from the total value of all assets.

TERMS USED IN MEASURES OF ECONOMIC PROFITABILITY⁷

Working Expenses

Cash payments for labour (excluding imputed labour and accommodation values) operating and administrative expenses.

Assessed Managerial Reward

This is an assessment of the payment that should be imputed to an owner/operator for his own labour and management skill. Calculated by adding each quota group's imputed value of farm worker's wage and one per cent of Farm Capital.

Working Capital

This is estimated to be one twelfth of the total adjusted working expenses. Since town supply farms have monthly milk cheques being paid into their current accounts, one twelfth of these expenses is considered a large enough proportion. The Sheep and Beef Survey allows 50 per cent of these expenses, as income may be received infrequently.

Farm Capital

This is the sum of the capital value of land and buildings (excluding homestead), plant and machinery, farm vehicles (excluding private car valued at \$10,548) and all livestock (valued at market values).

Total Farm Capital

This is the sum of Working and Farm Capital.

⁷ NZ Meat and Wool Board's Economic Service.
Sheep and Beef Farm Survey 1984-85, p.56.

Interest Paid

This is the interest paid from the annual accounts.

Rent Paid

This is the actual rent paid.

Economic Farm Surplus

This is the difference between the sum of net farm income, salaries paid, interest and rent, and the assessed managerial reward.

Rate of Return

This is the ratio of the Economic Farm Surplus to the Total Farm Capital expressed as a percentage.

Capital Turnover Percentage

This is the ratio of Gross Revenue to Total Farm Capital expressed as a percentage. It gives an indication of the rate at which a capital investment reproduces itself in the form of gross income.

Labour and Management Residual

This is an assessment of what the farmer earns as a reward for his own labour and management. The sum of 12.0 per cent interest (similar to the Economic Service Survey) is applied to Equity Capital in addition to the interest already paid on borrowed capital. The sum of 12.0 per cent of the calculated Equity Capital is subtracted from the sum of Net Farm Income and Managerial Salaries paid.

APPENDIX C

RELIABILITY OF SURVEY ESTIMATES

Estimates of farm characteristics based on a sample of farms are likely to differ from the figures which would have been obtained had information been collected from all farms in the population. The magnitudes of these differences or sampling errors of survey estimates in this report are presented in this Appendix in the form of relative standard errors (RSE) of the estimates in percentage terms. The relative standard error is defined as the standard error divided by the mean. The smaller the relative standard error, the more reliable the estimate.

Table 28 sets out the mean and relative standard error for key survey variables. For example, Table 28 shows that for New Zealand the survey estimate of average net farm income was \$33,403 with a relative standard error (RSE) of 6.19 per cent. In other words, it is 95 per cent confident that the true value of average net farm income lies within the range of $1.96 \times 6.19 \text{ per cent} \times \$33,403$ either side of the estimated value. That is within $\$33,403 \pm \$4,053$. Relative standard errors of estimates of the means for the various strata tend to be larger than for the New Zealand estimates because the sample size is smaller. Hence, more caution should be exercised in making inferences from the individual strata.

TABLE 28
Reliability of Survey Estimates

	North Island Quota Size (litres)				South Island Quota Size (litres)				New Zealand
	201-600	601-1000	1001+	All	201-600	601-1000	1001+	All	
Number of Farms	21	38	17	76	26	34	16	76	152
December Cows Milked									
- mean (Cows)	81.4	113.7	154.4	115.60	79.9	104.8	155.2	101.72	110.10
- RSE (%)	6.44	6.99	11.92	5.52	6.90	5.62	6.28	3.75	3.76
Dairy Productive Hectares									
- mean (hectares)	51.17	73.97	107.42	76.61	69.27	84.29	144.44	87.75	81.02
- RSE (%)	5.78	5.19	9.59	4.52	9.25	7.07	9.14	5.06	3.37
Gross Revenue									
- mean (\$)	86,712	147,716	230,539	152,947	98,286	145,509	244,264	140,244	147,913
- RSE (%)	5.23	2.85	8.12	3.82	4.96	4.77	6.11	3.18	2.67
Total Expenditure									
- mean (\$)	71,264	110,169	175,556	116,971	78,059	120,201	181,800	110,764	114,510
- RSE (%)	10.04	2.36	8.64	4.21	7.33	4.72	7.62	3.88	2.99
Net Farm Income									
- mean (\$)	15,448	37,547	54,983	35,976	20,227	25,308	62,464	29,480	33,403
- RSE (%)	25.14	10.87	13.72	8.31	18.30	12.66	12.46	8.62	6.19

Estimation Mathematics ^a

In addition to forming the usual estimates it was necessary to define the population of farms eligible for the survey since (as noted in Chapter 2) not all ineligible farms could be eliminated from the total population prior to selecting the sample.

Definitions

- N_h - the apparent stratum size (known).
- N_h^* - the number of farms in stratum h which satisfy the eligibility criteria (unknown).
- W_h - N_h^*/N_h , $N = \sum N_h$, $\hat{N}^* = \sum \hat{N}_h^*$
- n_h - the number of eligible farms (farmers) which provided data in stratum h (known).
- m_h - the number of ineligible farms drawn in the course of obtaining n (known).
- c_h - the number of eligible farms (farmers) who declined to provide data (known).
- $\hat{\pi}_h^*$ - \hat{N}_h^*/\hat{N}^* , the fraction of eligible farms in the total population coming from stratum h .
- $\bar{\mu}_h, \sigma_h^2$ - the unknown mean and variance of the eligible farms in stratum h .
- \bar{x}_h, s_h^2 - the mean and variance of the sampled eligible units in stratum h .
- $\bar{\mu}$ - $\sum \hat{\pi}_h \bar{\mu}_h$, the unknown mean of the characteristic under study over all eligible units.
- \bar{x} - $\sum \hat{\pi}_h \bar{x}_h$, the sample estimate of $\bar{\mu}$

^a The AERU acknowledges the useful discussions held with Mr J Jowett of the MAF in formulating the statistical procedures used in this survey.

Sampling Properties of Estimated Stratum Sizes:

$$\hat{\bar{W}}_h = \frac{n_h + c_h - 1}{n_h + c_h + m_h - 1}; \text{ unbiased estimator of } W_h.$$

$$\text{est. var. } \hat{\bar{W}}_h = \frac{\hat{\bar{W}}_h (1 - \hat{\bar{W}}_h)}{n_h + c_h + m_h - 2}; \left(1 - \frac{n_h + c_h + m_h - 1}{N_h} \right)$$

unbiased estimator of the variance of $\hat{\bar{W}}_h$.

The estimated stratum size is:

$$\hat{N}_h^* = N_h \hat{\bar{W}}_h \text{ with estimated variance equal to } N_h^2$$

multiplied by est. var. $\hat{\bar{W}}_h$.

$$\text{est. var. } \hat{N}_h^* = N_h^2 \text{ est. var. } \hat{\bar{W}}_h.$$

Mean and Standard Error (s.e.) of the Survey Estimates:

$$\bar{\bar{X}} = \sum \hat{\pi}_h^* \bar{X}_h \text{ where } \hat{\pi}_h^* = \hat{N}_h^* / \sum \hat{N}_h^*$$

$$\text{s.e. } \bar{\bar{X}} = \left[\sum (\hat{\pi}_h^* \text{s.e. } \bar{X}_h)^2 + \sum \left[\frac{(\text{est. var. } \hat{N}_h^*)^{\frac{1}{2}} \text{s.e. } \bar{X}_h}{N^*} \right]^2 \right. \\ \left. + \sum \left[\frac{(\text{est. var. } \hat{N}_h^*)^{\frac{1}{2}}}{N^*} (\bar{X}_h - \bar{\bar{X}})^2 \right] \right]^{\frac{1}{2}}$$

The first term in the equation for estimating the standard error (s.e.) of the survey mean is the normal estimate from a stratified sample. The other two terms relate to the uncertainty in relative stratum sizes. The recorded statistics relating to the estimated stratum sizes are presented in Table 29.

TABLE 29
Estimation of Stratum Sizes

Stratum	N_h	n_h	c_h	m_h	\hat{N}_h^*	$\hat{\pi}_h^*$
<u>North Island</u>						
201-600 litres	124	21	3	2	114	0.1744
601-1000 litres	185	38	3	3	172	0.2630
1001+ litres	115	17	2	1	109	0.1665
<u>South Island</u>						
201-600 litres	135	26	2	2	126	0.1921
601-1000 litres	92	34	3	2	87	0.1332
1001+ litres	49	16	2	1	46	0.0708
Total New Zealand	700	152				1.0000

APPENDIX D

SURVEY RESULTS BY REGION AND QUOTA GROUP

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TABLE 30

Average Areas of Town Supply Farms
by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number of Farms Surveyed	21	38	17	26	34	16
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)
Freehold Area	54.48	69.18	84.10	63.70	81.01	147.80
Crown & Maori Lease	0.18	1.87	3.70	9.61	2.46	3.46
Rented Area	7.75	7.53	29.31	5.48	5.87	14.08
Total Farm Area	62.41	78.58	117.11	78.79	89.34	165.34
Less Unproductive Area	4.94	4.18	4.35	4.88	3.89	10.31
Productive Area	57.47	74.40	112.76	73.91	85.45	155.03
Less Estimated Sheep, Beef and Cash Crop Area	8.19	4.91	16.40	6.64	3.90	12.05
Plus Estimated 'Grazing' Out Area	1.89	4.48	11.06	2.00	2.74	1.46
Dairy Productive Area Utilised for Milk Production	51.17	73.97	107.42	69.27	84.29	144.44

TABLE 31

Utilisation of Farm Area
By Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
	%	%	%	%	%	%
Proportion of Farm Area under:						
- Dairy Pasture	76.6	87.1	81.0	84.3	90.2	83.3
- Forage Crops	2.4	1.4	1.3	1.1	1.0	1.3
- Sheep & Beef Cattle Pasture & Cash Crops	13.1	6.2	14.0	8.4	4.4	8.3
- Unproductive Land	7.9	5.3	3.7	6.2	4.4	7.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 32

Irrigation Use
by Region and Quota Group^a

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Number of Farms Using Irrigation	2	5	2	11	16	10
- Percentage of Dairy Productive Area Irrigated	17%	37%	58%	71%	77%	55%
- Estimated Total Hours Irrigating	450	400	972	879	1,689	1,418

^a These results do not include weighted means. The average is calculated according to the number of practising farmers.

TABLE 33

Types of Labour Units
By Region and Quota Groups

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Farmer	0.97	0.91	0.90	1.00	0.95	0.95
Permanent Family	0.60	0.31	0.45	0.36	0.65	0.83
Casual Family	0.00	0.03	0.04	0.09	0.10	0.03
Total Family Labour Units	1.57	1.25	1.39	1.45	1.70	1.81
Permanent Non-Family	0.10	0.60	1.15	0.08	0.39	1.41
Casual Non-Family	0.13	0.07	0.05	0.06	0.12	0.06
Total Labour Units	1.80	1.92	2.59	1.59	2.21	3.28
Proportion of Permanent Labour	93%	95%	97%	91%	90%	97%
Proportion of Family Labour	87%	65%	54%	91%	77%	55%

TABLE 34

Milk Production by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Daily Quota (1)	429	777	1,259	486	751	1,302
Dairy Productive Hectares (ha)	51.17	73.97	107.42	69.27	84.29	144.44
Milk Production Sold at Quota Prices (1)	176,190	320,643	492,357	198,932	304,749	544,252
Milk Production Sold at Surplus Prices (1)	144,933	188,203	263,621	171,204	221,325	293,471
Total Litres Produced (1)	321,123	508,846	755,978	370,136	526,074	837,723
Proportion of Total Sold at Quota Prices (%)	55	63	65	54	58	65
Average No. Milking Cows in Feb 1985	75.7	104.2	151.6	76.5	97.7	144.1
Apr 1985	67.9	97.6	141.7	64.2	90.4	134.6
Jun 1985	59.5	80.0	123.8	51.5	68.6	123.4
Aug 1985	65.2	91.6	130.4	53.1	73.2	128.1
Oct 1985	77.0	112.6	162.4	76.1	100.5	157.8
Dec 1985	81.4	113.7	154.4	79.9	104.8	155.2
Total Litres Converted to 4.18% Milk Fat (kg)	13,423	21,270	31,600	15,472	21,990	35,017
Kg Milk Fat/Dairy Productive ha (kg)	264	293	296	225	263	244
Litres/December Milking Cows (1)	3,945	4,475	4,896	4,632	5,020	5,398
Litres/Dairy Productive ha (1)	6,276	6,879	7,038	5,343	6,241	5,800
December Cows/Dairy Productive ha (No.)	1.59	1.54	1.44	1.15	1.24	1.07

TABLE 35

Capital Structure - Value of all Assets and Liabilities
by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Total Litres Produced	321,123	508,846	755,978	370,136	526,074	837,723
Cows in Milk in December 1985	81.4	113.7	154.4	79.9	104.8	155.2
Dairy Productive Hectares	51.17	73.97	107.42	69.27	84.29	144.44
Freehold Area (ha)	54.48	69.18	88.40	63.70	81.01	147.80
<u>Assets</u>	\$	\$	\$	\$	\$	\$
Freehold Land (valued at 31.12.1985) ^a	365,259	519,176	690,786	237,323	372,858	631,520
Farmer's House (1/2 Book Value)	23,963	21,395	29,312	18,847	20,495	25,155
Other Farm Houses	9,705	10,977	10,756	4,640	5,379	13,453
Farm Buildings	16,999	20,602	25,697	19,827	24,331	31,896
Plant & Equipment	7,317	11,368	17,848	16,501	18,524	31,921
Farm Vehicles	17,558	25,742	35,029	21,518	25,082	47,370
Dairy Stock	17,760	24,360	34,587	17,636	24,745	40,250
Other Stock	1,672	3,171	1,692	180	302	386
Company Shares	672	2,060	2,798	2,563	2,794	3,859
Total Farm Assets	460,905	638,851	848,505	339,035	494,510	825,810
Cash at Bank	6,991	7,066	10,901	9,473	4,764	29,892
Sundry Debtors	4,409	7,685	12,900	5,271	8,213	16,514
Other Current Assets	2,036	3,087	4,160	4,250	11,277	4,864
Total All Assets	474,341	656,689	876,466	358,029	518,764	877,080

a Details of the updating of land values are listed in Appendix B.

(Table 35 cont ...)

TABLE 35 (cont...)

Capital Structure - Value of all Assets and Liabilities

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
	\$	\$	\$	\$	\$	\$
<u>Current Liabilities</u>						
Bank Overdraft	4,688	9,601	13,272	5,261	9,725	9,727
Sundry Creditors	3,850	7,181	14,962	6,195	10,640	16,460
Other Current Liabilities	1,698	3,227	3,647	3,629	9,360	3,197
Total Current Liabilities	10,236	20,009	31,881	15,085	29,725	29,384
<u>Fixed Liabilities</u>						
Rural Bank Mortgages	38,740	36,215	57,805	75,952	55,731	30,273
Trading Bank Mortgages	19,170	12,724	22,852	7,885	10,094	25,166
Building Society Mortgages	3,344	6,988	2,971	74	180	5,431
Insurance Company Loans	3,252	10,217	26,134	3,754	7,862	24,603
Stock Firm Loans	831	905	1,738	692	2,536	1,075
Finance Co. Loans	2,520	2,607	7,212	2,436	2,590	1,562
Solicitor's Loans	8,823	44,785	30,727	1,933	21,835	42,879
Family Mortgages	27,208	35,788	27,332	14,030	36,604	14,323
Other Liabilities	1,594	7,696	1,841	7,483	3,320	5,522
Total Fixed Liabilities	105,482	157,925	178,612	114,239	140,752	150,834
Total All Liabilities	115,718	177,934	210,493	129,324	170,477	180,218
Equity	358,623	478,755	665,973	228,705	348,287	696,862
Total	474,341	656,689	876,466	358,029	518,764	877,080

TABLE 36

Gross Revenue Components by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Total Litres						
Produced	321,123	508,846	755,978	370,136	526,074	837,723
Cows in Milk in						
December 1985	81.4	113.7	154.4	79.9	104.8	155.2
Dairy Productive						
Hectares	51.17	73.97	107.42	69.27	84.29	144.44
	\$	\$	\$	\$	\$	\$
Milk Sales	75,645	125,502	199,080	83,786	125,506	206,133
Produce Sold	678	875	1,080	833	1,906	6,527
Wool & Skins Sold	401	169	813	817	80	438
Contracting Fees	187	1,009	1,010	1,869	997	530
Rent & Lease Fees	404	1,188	894	452	576	415
Employee's House	83	368	824	279	318	1,641
Livestock Profit						
- Dairy	8,803	12,952	21,868	6,984	13,731	3,354
- Other Stock	-612	2,553	1,008	796	556	1,119
Other Revenue	1,123	3,100	3,962	2,470	1,839	4,107
Gross Revenue	86,712	147,716	230,539	98,286	145,509	244,264

TABLE 37

Types of Milk Payments Received by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Total Litres Produced	321,123	508,846	755,978	370,136	526,074	837,723
Cows in Milk in December 1985	81.4	113.7	154.4	79.9	104.8	155.2
Dairy Productive Hectares	51.17	73.97	107.42	69.27	84.29	144.44
	\$	\$	\$	\$	\$	\$
Payment Received for Milk Paid at Quota Prices	46,916	85,666	134,440	53,425	82,677	147,378
Payment Received for Milk Paid at Surplus Prices	18,558	25,689	42,535	22,066	29,150	36,591
Special Production Allowances	261	1,410	3,638	1,245	2,509	3,868
Premiums Received or Penalties Paid	-356	392	269	-74	234	1,521
Farm Chilling Allowances	62	94	227	105	135	597
End of Season, Retrospective and Other Payments	10,204	12,251	17,971	7,019	10,801	16,178
Total Milk Payments Received (Milk Sales)	75,645	125,502	199,080	83,786	125,506	206,133

TABLE 38

Farm Expenditure Components by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Total Litres Produced	321,123	508,846	755,978	370,136	526,074	837,723
Cows in Milk in December 1985	81.4	113.7	154.4	79.9	104.8	155.2
Dairy Productive Hectares	51.17	73.97	107.42	69.27	84.29	144.44
<u>Labour</u>	\$	\$	\$	\$	\$	\$
Family Labour	1,893	2,204	2,582	2,355	4,736	5,618
Family Casual Labour	64	751	443	717	562	418
Non-Family Permanent & Casual Labour	2,829	9,676	18,854	3,051	7,383	20,972
Unpaid Family Labour	5,232	2,504	3,047	2,582	5,524	7,476
Labour Accommodation	83	395	882	279	309	1,641
Sub-Total Labour	10,101	15,530	25,808	8,984	18,514	36,125
<u>Operating</u>						
Animal Health	2,034	3,473	5,831	2,066	3,786	5,181
Breeding & Herd Testing	866	2,044	2,582	1,111	2,822	3,262
Contractors	1,188	2,420	3,750	2,916	3,758	3,690
Dairy Shed Expenses	2,142	2,683	3,319	2,327	2,526	3,339
Electricity	1,839	2,721	3,771	2,099	3,320	4,475
Fertiliser & Seed	5,125	8,620	15,169	4,926	6,149	13,276
Feed	3,948	5,912	7,998	6,290	10,747	12,697
Grazing Expenses	1,570	2,514	5,812	502	1,065	589
Freight	422	464	1,405	713	1,347	1,171
Weed & Pest Expenses	454	878	1,308	455	741	1,648
Vehicle Expenses	6,288	9,182	12,489	8,416	11,813	14,809
Repairs and Maintenance	8,146	11,747	18,211	8,725	14,899	22,271
Irrigation Expenses	66	37	224	297	852	1,520
Sub-Total Operating	34,088	52,695	81,869	40,843	63,825	87,928

(Table 38 cont ...)

TABLE 38 (cont ...)

Farm Expenditure Components by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
	\$	\$	\$	\$	\$	\$
<u>Administration</u>						
Accountancy	957	1,238	1,675	864	1,170	1,611
Telephone	439	654	1,036	516	651	793
General Administration	1,319	1,659	2,027	842	1,729	2,735
Sub-Total Administration	2,715	3,551	4,738	2,222	3,550	5,139
<u>Overheads</u>						
Insurance	1,165	1,951	2,539	1,498	2,178	4,952
Interest	12,962	21,695	29,935	13,320	16,924	23,711
Rates	1,909	3,084	4,463	2,117	2,787	3,816
Rent	2,179	3,119	13,684	1,581	2,828	4,690
Sub-Total Overheads	18,215	29,849	50,621	18,516	24,717	37,169
Total Cash Expenses	65,119	101,625	163,036	70,565	110,606	166,361
Net Depreciation	6,145	8,544	12,520	7,494	9,595	15,439
Total Expenditure	71,264	110,169	175,556	78,059	120,201	181,800

TABLE 39

Depreciation of Farm Assets by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1001	1001+
Number Surveyed	21	38	17	26	34	16
Total Litres Produced	321,123	508,846	755,978	370,136	526,074	837,723
Cows in Milk in December 1985	81.4	113.7	154.4	79.9	104.8	155.2
Dairy Productive Hectares	51.17	73.97	107.42	69.27	84.29	144.44
	\$	\$	\$	\$	\$	\$
Farm Buildings Depreciation	1,517	2,491	3,138	1,707	1,993	4,023
Plant & Equipment Depreciation	1,140	1,763	3,857	1,912	3,368	4,128
Farm Vehicle Depreciation	3,584	5,370	6,232	4,197	4,864	9,683
Gross Depreciation	6,241	9,624	13,227	7,816	10,225	17,834
Less Personal Car Depreciation	290	334	719	326	517	295
Less Depreciation Recovered by Sales	- 194	746	- 12	- 4	113	2,100
Net Depreciation	6,145	8,544	12,520	7,494	9,595	15,439
Cost of New Assets	13,209	13,408	29,703	22,800	16,510	18,386

TABLE 40

Net Farm Income Components by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Total Litres Produced	321,123	508,846	755,978	370,136	526,074	837,723
Cows in Milk in December 1985	81.4	113.7	154.4	79.9	104.8	155.2
Dairy Productive Hectares	51.17	73.97	107.42	69.27	84.29	144.44
	\$	\$	\$	\$	\$	\$
Gross Revenue	86,712	147,716	230,539	98,286	145,509	244,264
Total Expenditure	71,264	110,169	175,556	78,059	120,201	181,800
Net Farm Income	15,448	37,547	54,983	20,227	25,308	62,464
Net Farm Income Per Dairy Productive Hectare	302	508	512	292	300	432
Net Farm Income Per December Milking Cow	190	330	356	253	241	402

TABLE 41

Cash Surplus from Farming
by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Total Litres Produced	321,123	508,846	755,978	370,136	526,074	837,723
Cows in Milk in December 1985	81.4	113.7	154.4	79.9	104.8	155.2
Dairy Productive Hectares	51.17	73.97	107.42	69.27	84.29	144.44
	\$	\$	\$	\$	\$	\$
1. <u>Cash Received:</u>						
Milk Sales	75,645	125,502	199,080	83,786	125,506	206,133
Dairy Cattle Sales	8,102	10,974	18,528	7,466	14,064	24,017
Sheep and Beef Sales	242	53	279	1,008	851	318
Bobby Calf Sales	1,956	3,700	4,995	2,325	3,367	4,301
Other Farm Income	2,793	6,341	7,759	6,441	5,398	12,017
Total Received	88,738	146,570	230,641	101,026	149,186	246,786
2. <u>Cash Spent:</u>						
Labour and Operating	38,874	65,326	103,748	46,966	76,506	114,936
Overhead and Administration	20,930	33,400	55,359	20,738	28,267	42,308
Dairy Purchases	2,063	2,735	4,715	3,439	4,414	7,074
Sheep and Beef Cattle Purchases	954	22	145	24	170	1,893
Total Spent	62,821	101,483	163,967	71,167	109,357	166,211
Cash Surplus from Farming	25,917	45,087	66,674	29,859	39,829	80,575

TABLE 42

Net Farm Income Less Imputed Interest on Equity and
Total Farm Assets by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Total Litres Produced	321,123	508,846	755,978	370,136	526,074	837,723
Cows in Milk in December 1985	81.4	113.7	154.4	79.9	104.8	155.2
Dairy Productive Hectares	51.17	73.97	107.42	69.27	84.29	144.44
Equity	358,623	478,755	665,973	228,705	348,287	696,862
Net Farm Income	15,448	37,547	54,983	20,227	25,308	62,464
A. Net Farm Income						
Less Imputed Interest on Equity at Rate of: 3.5%	2,896	20,791	31,674	12,222	13,118	38,074
5.0%	- 2,483	13,609	21,684	8,792	7,894	27,621
7.0%	- 9,656	4,034	8,365	4,218	928	13,684
Total Farm Assets	460,905	638,851	844,505	339,035	494,510	825,810
Net Farm Income	15,448	37,547	54,983	20,227	25,308	62,464
Interest Paid	12,962	21,695	29,935	13,320	16,924	23,711
B. Net Farm Income						
Plus Interest Paid Less Imputed Interest on Total Farm Assets at rate of 3.5%	12,278	36,882	55,220	21,681	24,924	57,272
5.0%	5,365	27,299	42,493	16,595	17,507	44,885
7.0%	- 3,853	14,522	25,523	9,815	7,616	28,368

TABLE 43

Measures of Economic Profitability by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Freehold Land Area (ha)	54.48	69.18	84.10	63.70	81.01	147.80
Rented and Grazing-Out Area (ha)	9.82	13.88	33.01	17.09	11.07	19.00
<hr/>						
A. Return on Capital						
1. Working Expenses (less imputed costs)	41,589	68,877	108,486	49,188	80,056	120,075
2. Plus assessed Managerial Reward	16,954	21,803	29,039	17,375	21,198	23,864
<hr/>						
3. Total Adjusted Working Expenses (1 + 2)	58,543	90,680	137,525	66,563	101,254	143,939
4. Working Capital (8.33% of 3)	4,877	7,554	11,456	5,545	8,434	11,990
<hr/>						
Freehold, Rented and Grazing-Out Land Buildings (less Farmer's house)	431,097	623,341	961,926	300,994	423,809	712,703
Plant & Equipment	26,704	31,579	36,453	24,467	29,710	45,349
Farm Vehicles	7,317	11,368	17,848	16,501	18,524	31,921
(less car at \$10,548)	7,010	15,194	24,481	10,970	14,534	36,822
Livestock at Market Value	66,500	98,100	128,000	60,800	84,800	138,700
<hr/>						
5. Farm Capital	538,628	779,582	1,168,708	413,732	571,377	965,495
<hr/>						
6. Total Farm Capital (4 + 5)	543,505	787,136	1,180,164	419,277	579,811	977,485
7. Net Farm Income	15,448	37,547	54,983	20,227	25,308	62,464
8. Plus Interest Paid	12,962	21,695	29,935	13,320	16,924	23,711
9. Plus Rent Paid	2,179	3,119	13,684	1,581	2,828	4,690
<hr/>						
10. Sub-total (7+8+9)	30,589	62,361	98,602	35,128	45,060	90,865
11. Less Managerial Reward (2)	16,954	21,803	29,039	17,375	21,198	23,864
<hr/>						
12. Economic Farm Surplus (10-11)	13,635	40,558	69,563	17,753	23,862	67,001
13. Rate of Return Percentage (12/6)	2.51%	5.15%	5.89%	4.23%	4.12%	6.85%

TABLE 43 (cont ...)

Measures of Economic Profitability by Region and Quota Group^a

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
<u>B. Capital Turnover Percent</u>						
14. Gross Revenue (less worker's house)	86,629	147,348	229,715	98,007	145,191	242,623
15. Total Farm Capital (6)	543,505	787,136	1,180,164	419,277	579,811	977,485
16. Capital Turnover Percentage (14/15)	15.9%	18.7%	19.5%	23.4%	25.0%	24.8%
<u>C. Labour & Management Residual</u>						
17. Total Farm Capital (6)	543,505	787,136	1,180,164	419,277	579,811	977,485
18. Plus Cash at Bank, Sundry Debtors & Other Current Assets	13,436	17,838	27,961	18,994	24,254	51,270
19. Sub-total (17+18)	556,941	804,974	1,208,125	438,271	604,065	1,028,755
20. Less Fixed Liabilities	105,482	157,925	178,612	114,239	140,752	150,834
21. Less Current Liabilities	10,236	20,009	31,881	15,085	29,725	29,384
22. Total Equity Capital (19-20-21)	441,223	627,040	997,632	308,947	433,588	848,537
23. Net Farm Income (7)	15,448	37,547	54,983	20,227	25,308	62,464
24. Less 12.0% of Equity Capital (22)	52,947	75,245	119,716	37,074	52,031	101,824
25. Labour & Management Residual (23-24)	-37,499	-37,698	-64,733	-16,847	-26,723	-39,360

^a Most of the terms used in this table are particular to this table alone; they are defined in Appendix B.

TABLE 44

Supplementary Feed Use by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Number of Farms with Home Grown Hay	20	34	15	25	33	15
- Average No. of Home Grown Bales per Farm	2,825	2,438	3,288	2,919	3,815	6,623
Number of Farms with Purchased Hay	11	14	7	16	23	8
- Average No. of Purchased Bales	1,516	1,504	3,050	1,974	2,449	3,168
Number of Farms Making Silage	13	34	16	19	32	14
- Average No. of tonnes of Silage made	216	373	534	293	521	893
Number of Farms with Home Grown Grain	0	0	0	2	4	4
- Average No. of tonnes of Home Grown Grain	0	0	0	25	31	29
Number of Farms with Purchased Grain	1	3	1	9	5	3
- Average tonnes of Purchased Grain	25.0	16.3	60.0	26.5	41.0	23.8
Number of Farms with Purchased Dairy Meal or Bran	6	8	3	4	10	4
- Average tonnes of Dairy Meal Purchased	12.4	11.5	8.7	8.4	20.2	42.0
Number of Farms Growing a Forage Crop	9	14	8	8	12	5
- Hectares Grown	3.47	2.93	4.11	2.82	2.62	5.81

TABLE 45

Run-Off Area by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Number of Farms with a Run-Off	10	22	11	10	21	13
- Run-Off Area (ha)	21.98	21.42	44.26	23.37	22.12	38.50
- Distance from Home Farm to Run-Off (km)	5.63	7.03	5.49	4.76	5.57	12.73

TABLE 46

Non-Family Adult Worker's Annual Wage Paid and Years of Experience by Region and Quota Group

Quota Litres	North Island			South Island		
	201-600	601-1001	1001+	201-600	601-1000	1001+
Number Surveyed	21	38	17	26	34	16
Non-Family Adult Workers:						
- Number of Farms with a worker for a full year	4	13	12	3	10	14
- Annual Average Wage Paid (\$)	11,568	14,007	17,352	13,238	15,484	14,209
- Previous Years of Dairy Experience	4.0	5.6	6.9	6.0	6.4	6.6

APPENDIX E

SURVEY RESULTS OF PREVIOUS YEARS

TABLE 47

Comparisons with Survey Results of Previous Years

	1981-82	1982-83	1983-84	1984-85	1985-86
NZ Suppliers (No.)	1,377	1,309	1,278	1,247	1,214
Survey Sample (No.)	152	152	152	152	152
<u>(a) Physical Characteristics</u>					
Dairy Productive Area (ha)	86.55	87.93	83.59	84.75	81.02
Daily Quota (l)	786	772	763	795	774
Herd Size (No. Milking in Dec.)	101	108	108	112	110
Milk Production (l/farm)	498,797	473,153	474,217	531,539	516,188
Litres per Dairy Productive hectare (l/ha)	5,763	5,381	5,673	6,272	6,373
Litres per December Milking Cow (l/cow)	4,945	4,380	4,390	4,742	4,693
<u>(b) Financial Characteristics</u>					
Total Farm Assets (\$/farm)	557,999	672,446	644,460	681,133	583,348
Total Farm Assets per Dairy Prod. ha (\$/ha)	6,447	7,648	7,710	8,037	7,200
Gross Revenue (\$/farm)	103,044	122,481	124,458	143,036	147,914
Total Expenditure (\$/farm)	78,853	95,741	97,767	111,076	114,510
Expenditure per December Milking Cow (\$/cow)	781	886	905	991	1,040
Net Farm Income (\$/farm)	24,191	26,740	26,691	31,960	33,403
Net Farm Income (c/l)	4.85	5.65	5.63	6.01	6.47
Net Farm Income per Dairy Prod. ha (\$/ha)	280	304	319	377	412

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