AN ECONOMIC SURVEY

OF NEW ZEALAND

TOWN MILK PRODUCERS

1976-77

L.E. DAVEY
R.G. MOFFITT
M. PANGBORN

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THE AGRICULTURAL ECONOMICS RESEARCH UNIT

Lincoln College, Canterbury, N.Z.

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PREFACE

This Report is the fourth 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 Producers 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.

The field work for this survey was carried out by Russell Moffitt and Marvin Pangborn. Russell Moffitt completed the majority of the analysis and in conjunction with Lance Davey compiled the Report.

J.B. Dent
Director

July 1977

ABBREVIATIONS USED IN THIS REPORT

No.	=	number
ha	=	hectares
prod. ha	=	productive hectares
l	=	litres
L.U.	=	Labour Units
m.	=	million
milk prod.	=	milk produced
exps.	=	expenses
equip.	=	equipment
M.P.	=	Milk Producer
Assn.	=	Association
N.A.	=	Not Available

SUMMARY OF 1975-76 AND 1976-77

SURVEY RESULTS

Characteristic	1975-76	1976-77
Farms Surveyed (no.)	90	152
Total Farm Area (ha/farm)	86.3	87.4
Productive Farm Area (ha/farm)	77.7	81.8
Dairy Productive Farm Area (ha/farm)	75.2	79.4
Daily Quota (l/farm)	726	766
Herd Size (cows/farm)	105	112
Labour (L.U./farm)	2.02	2.13
Milk Production (l/farm)	385,346	433,753
(l/ha)	4,466	4,965
(l/prod. ha)	4,959	5,304
(l/dairy prod. ha)	5,124	5,465
(l/L.U.)	190,759	203,639
(l/cow)	3,659	3,883
Total Value of Assets ($/farm)	223,081	248,981
Gross Revenue ($/farm)	38,513	46,955
Total Expenditure ($/farm)	27,170	33,462
Net Income ($/farm)	11,343	13,493
Gross Revenue (cents/l)	9.995	10.825
Total Expenditure (cents/l)	7.051	7.714
Net Income (cents/l)	2.944	3.110

SUMMARY

Physical and Production Aspects

. The average size of the farms surveyed (including run-off areas) was 87.4 ha, 1.1 ha more than for the previous (1975-76) survey. Average productive area was 81.8 ha.

. Forty eight percent of survey farms were individually owned. Husband-wife partnerships were the next most common form of ownership. Land tenure was predominantly freehold.

. The average number of milking cows per farm was 112 compared with 105 in 1975-76 and 102 in 1974-75. The numbers on individual farms varied from 32 to 213 milking cows.

. Total milk production per farm (433,752 l) was 12.6 percent higher than for 1975-76.

. The proportion of milk sold at town milk prices was 72.1 percent. This compares with 76.5 percent for the 1975-76 survey.

. Milk production per farm, per productive dairy hectare, per labour unit and per cow were all higher than for the previous survey.

- The average total labour employed (2.13 labour units) was slightly higher than for 1975-76 (2.02 labour units).

- Average daily quota recorded on the survey farms was 766 litres compared with the previous survey estimate of 726 litres and an actual national average figure for direct quota holders of 735 litres.

Financial Aspects

- The average net price received per litre of all milk produced was 9.5026 cents compared with 8.9052 cents in 1975-76.

- Milk sales accounted for 88 percent of gross revenue (89 percent in 1975-76).

- Total farm expenditure ($33,462) was 23 percent higher than for the previous survey ($27,170). All expenditure classes were higher than for the previous survey except for depreciation.

- Average net farm income for all farms for 1976-77 was $13,493 compared with $11,344 in 1975-76. The recorded average for North Island farms was $15,679 and for South Island farms $10,044.

- Average net depreciation was $2,714 compared with the 1975-76 survey estimate of $3,215.

- Net farm income on a cents per litre of total milk produced basis was 3.11 cents compared to 2.94 cents in 1975-76 and 3.69 cents in 1974-75.

- Livestock trading profit increased from $2,266 in 1975/76 to $3,599 in 1976/77.

- The average value of farm assets was $240,247 which represents an increase of 7.7 percent over the figure recorded for 1975-76.

- Total liabilities per farm were $65,507, a 28 percent increase.

- Net worth as a percent of the value of all assets averaged 74 percent compared with 76 percent for the 1975-76 survey.

- The amount spent on farm development work was $905 compared with $876 in 1975-76.

- The calculated rate of return on farm capital was 4.31 percent over all farms.

- The capital turnover percentage over all farms was 19.45 percent.

- The labour and management residual was $336 for all farms.

No attempt has been made in this Report to draw any conclusions on the differences in profitability between North or South Island farms or whether an increase in town milk prices is justifiable. The analyses have been carried out primarily to meet the basic objective of the survey, namely the determination of national net farm income.

CHAPTER 1

BACKGROUND

1.1 Objectives of the National Farm Survey

As in previous years, the principal objective of the 1976-77 survey was to ascertain the average net farm income received by town milk producers in New Zealand. Information produced by the survey is used to assist decisions concerning applications for price increases from specific producer groups. The national average cost and return levels are used as benchmarks with which costs and return figures derived from smaller regional surveys can be compared. The survey data obtained 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 advisors, and Government policy makers.

1.2 Climatic Conditions

Apart from the lower part of the South Island which experienced drought in the autumn, weather conditions over the early part of the year allowed most farmers to enter the 1976 winter with adequate reserves of stored feed.

The heavier rainfall and slightly warmer conditions experienced in many areas enabled the majority of town milk farmers to produce more milk from grass than in the previous year.

In the spring months of 1977 there was more rain than usual in much of the North Island. Grass growth however, was better than in the previous spring. In the South Island most regions experienced a cool, mild spring with slow pasture growth.

1.3 Producer Prices

Changes in the town milk producer price have continued to be linked to changes in the average manufacturing price for whole milk for all major uses. An increase (or decrease) in price of one cent per kilogram of milkfat results in an increase (or decrease) of 0.06 cents per litre in the town milk producer price. Town Supply milk prices are established on the first day of September each year for the ensuing 12 month period. The prices are linked to manufacturing prices which were established in June.

The national average advance prices for the year commencing on 1 September 1976 were fixed at 9.7503 cents per litre for finest grade, 9.3833 cents per litre for first grade, and 8.6513 cents per litre for second grade.

The final national prices per litre for the 1976-77 milk year for the three grades of town milk were 10.8141 cents for finest, 10.4471 cents for first, and 9.7151 cents for second. These final prices include all supplementary payments and bonuses.

Table 1 gives a summary of the national average town milk producer prices for finest grade milk over the past three N.Z. Milk Board financial years.

TABLE 1

National Average Town Milk Producer Prices

Year Commencing 1st September	Finest Grade Advance Price (cents per litre)	Finest Grade Final Price (cents per litre)
1974	9.3184	9.2086
1975	9.1965	10.0371
1976	9.7503	10.8141

Source: New Zealand Milk Board.

Most producer companies are actually paid at standard seasonal prices. These prices average back to the national average prices 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 prices.

As in past years special producer prices over and above the national average price, have been paid in

certain districts with particular production problems. A proportion of these allowances is reviewed each year.

Table 2 summarises the national, seasonal and district town milk prices for the year ended 31 August, 1977.

TABLE 2

Town Milk Producer Prices for Years ending 31 August 1976 and 1977

Part 1. NATIONAL AND SEASONAL PRICES

Grade of Milk	Year ended 31 August	Seasonal Prices (cents per litre) National Town Milk Price	Spring & Summer (Sept. to Jan.incl.)	Autumn (Feb. to April incl.)	Winter (May to August incl.)
Finest	1976	10.0371	8.3176	10.0176	12.5676
	1977	10.8141	8.9908	10.7908	13.5008
First	1976	9.6701	7.9506	9.6506	12.2006
	1977	10.4471	8.6238	10.4238	13.1338
Second	1976	8.9381	7.2186	8.9186	11.4686
	1977	9.7151	7.8918	9.6918	12.4081

Part 2. ADDITIONAL LOCAL PRICES

District	Cents per litre over six autumn and winter months 1976	1977
(a) All South Island	0.735	0.735
(b) Tokoroa and Mangakino	0.550	0.550
Rotorua	0.660	0.660
Gisborne	0.367	0.367
Hawke's Bay	0.367	0.367
Ruapehu	0.735	0.735
Wellington 30-mile area	0.185	0.185
Christchurch	0.367*	0.367*
Dunedin	0.250*	0.250*
Balclutha	0.250*	0.250*
North Otago	0.735*	0.735*
Central Otago	1.100*	1.100*
Southland	0.735*	0.735*

Source: N.Z. Milk Board

*Additional to South Island allowance 2(a) above.

1.4 Town Milk Production Data

Total town milk production in the year ending 31 August 1977 was 1.9 percent higher than for the previous year. Table 3 shows the total production and sale of milk passing through the National Milk Scheme for the years ending 31 August 1975, 1976, and 1977. The proportion of milk sold at town milk prices dropped over this three year period.

TABLE 3

Total Town Milk Production

Year ending 31 August	Milk Production m. litres	Milk sold at town milk prices m. litres	Proportion of milk sold at town milk prices %
1975	671.7	517.1	77.0
1976	725.5	536.8	74.0
1977	739.3	534.7	72.3

Source: N.Z. Milk Board 24th Annual Report 1977.

Total milk sales to consumers were 399.5m litres. This was 3.6 percent below the 1976 figure. The decline in sales has been influenced by an increase in the consumer price from four cents to eight cents per 600ml bottle from 1 February 1976 and a further increase of one cent per 600ml bottle from 1 February 1977. For the period September 1976 to January 1977, when consumer prices

were four cents per 600ml bottle higher than the corresponding period of the previous year, sales declined by 6.14 percent. For the period February 1977 to August 1977, when there was a further increase of one cent per bottle over the previous year, sales declined by 1.70 percent. In accordance with Government policy nominated quantities* were frozen at their 1975-76 levels and because of reduced sales no changes were made in the case of individual associations.

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*Nominated quantities is the quantity of milk which producer associations contract to guarantee daily to meet the liquid milk demand for the year.

1.5 Town Milk Suppliers and Quotas

There were 1,728 town milk quota holders during the 1976-77 Milk Board year compared with 1,704 for the previous year, and in addition, there were four companies holding quotas. A summary of the number of quota holders over the past three years is given in Table 4, while Table 5 gives details of quota holding dairy companies in 1976-77.

TABLE 4

Town Milk Suppliers and Daily Quotas

Year ending 31 August	Type of Quota Holders	Total N.Q.[a] (l)	No.Town Milk Suppliers	Average Daily Quota per Supplier (l)
1975	Total N.Z. Suppliers	1,254,050	1,693	740.73
	Dairy Companies	51,691	8	6,461.38
	Direct Quota Holders	1,202,359	1,685	713.57
1976	Total N.Z. Suppliers	1,298,528	1,709	759.82
	Dairy Companies	51,376	5	10,275.20
	Direct Quota Holders	1,247,152	1,704	731.90
1977	Total N.Z. Suppliers	1,298,528	1,732	749.73
	Dairy Companies	28,137	4	7,034.25
	Direct Quota Holders	1,270,391	1,728	735.18

[a]Nominated quantity

Source: N.Z. Milk Board.

TABLE 5

Quota Holding Companies 1976-77

Name of Company	Quota held (1)	Supply District	No. of sub-quota holders
East Tamaki	15,216	Auckland	63
East Tamaki	1,103	Franklin	6
Bruntwood	8,110	Hamilton	9
Henley	3,708	Dunedin	11
Total	28,137	Total	89
Proportion of Total Nominated Quota:	2.16 %	Proportion of Total no. of Suppliers	5.13 %

Source: N.Z. Milk Board.

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.

For this survey (1976/77 year) a completely new sample was selected. All town milk farms were eligible for selection provided the following criteria were satisfied:

(i) The farm supplied a producer association that had a nominated quota (N.Q.) of more than 10000 litres daily.

(ii) The farm itself had a daily quota of more than 200 litres.

(iii) The farm received at least 75 percent of gross revenue from town milk sales.

(iv) The farm engaged no sharemilker.

(v) The farmer had been producing town milk on a particular farm over the entire 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 a questionnaire returned by approximately 70 percent of town milk producers prior

to sample selection enabled further farms to be 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 1720 farms provided by the Milk Board the eligible population was reduced to 1369 prior to sample selection. Farms were selected at random from the reduced list and the farmers contacted by representatives of the New Zealand Milk Board and the Producer Companies. 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 approximately the correct number was obtained for each strata.

2.2 Sample Stratification

Analysis of previous survey information indicated that accuracy could be improved by sample stratification. Accordingly the sample was stratified on the basis of two regional groups (North Island and South Island) and three quota sizes (200 - 600 litres, 601 - 1000 litres and 1001 + litres).

In comparison with previous surveys the sample size was increased from 90 to 152 and the proportion of South Island producers increased. The changes in sample

size and stratification were based on a need to more accurately assess National Net Farm Income and also more accurately assess differences between South Island Net Farm Income and the National figure.

Because final eligibility was not determined until the farmer was approached it was necessary to estimate the total number of farms in each strata following this visit. Table 6 shows the number of survey farms for each strata compared with the population for each strata. Further details are given in Appendix C.

TABLE 6

Population and Sample Distribution by Strata[b]

Strata	Estimated Total No. of Farms in Strata[a]	Estimated Proportion of Total Farms in Strata[a]	Number of Farms Surveyed	Proportion of Total Farms Surveyed[a]
North Island				
200-600 litres	187	0.219	30	0.197
601-1000 "	225	0.263	35	0.230
1001+ "	111	0.130	11	0.072
Total N.I.	523	0.612	76	0.500
South Island				
200-600 "	162	0.189	37	0.243
601-1000 "	125	0.146	30	0.197
1001 + "	45	0.053	9	0.059
Total S.I.	332	0.388	76	0.500
New Zealand	855	1.000	152	1.000

[a] See Appendix C.

[b] Because of rounding some columns do not add exactly to the totals shown.

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 give 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 overall New Zealand results (and also the North Island and South Island results). This procedure ensures that each group (strata) assumes its correct degree of importance in the final results.

2.4 Data Collection and Assembly

Field work commenced in March 1978 and was completed by June.

To maintain uniformity and continuity of the survey the manual of procedures as 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 1976-77 financial year was obtained from the farmer or his accountant. Milk production records for the farms surveyed were compiled from the records of producer associations. Accounts of farms where managers were employed were adjusted to an owner-operated basis. Likewise, 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.

All financial and production data collected referred to the farm's financial year. Table 7 shows the distribution of farm account balance dates as determined from a census[1] of town milk producers carried out in September 1977. It can be seen that approximately 60 percent of all balance dates were March 31.

TABLE 7

Distribution of Balance Dates[a]

Percent of Farms with Balance Date Falling on:-						
March 31	April 30	May 31	June 30	July 31	August 31	Total
61	1	9	20	2	6	100

[a]Source: Unpublished Census of Town Milk Producers, September 1977.

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.

Where possible, data were transferred directly from the farm accounts to the relevant income and expenditure categories on the assembly form. Trade discounts, subsidies and allowances for personal use

[1]Unpublished: 69 percent return of questionnaires.

were deducted from the appropriate expense item before entry. Development expenditure was isolated and deducted from the relevant expense items where appropriate.

A complete list of all survey definitions is given in Appendix B.

CHAPTER 3

PHYSICAL AND PRODUCTION DATA

3.1 Physical Characteristics of Farms

3.1.1 Farm Area

Tables 8 and 8a show farm area estimates from the survey. In Table 8 these are presented for North Island, South Island and New Zealand, and in Table 8a the figures are broken down by region and quota group.

The average size of farm plus run-off area for North Island farms was 91.57 hectares, for South Island farms 80.71 hectares, and for the overall average New Zealand farm, 87.37 hectares. Farm sizes ranged from 26.66 to 233.82 hectares in the North Island and from 27.31 to 215.65 hectares in the South Island.

The term "grazing out" refers to the use of grazing land on neighbouring properties. This was converted to an annual basis depending on the number of months grazing. Thirty seven of the 152 survey farms grazed out stock. The practice occurred on 26 percent of North Island farms and 22 percent of South Island farms.

TABLE 8

Average Area of Town Supply Farms by Region

	North Island (ha)	South Island (ha)	New Zealand (ha)
Number of Farms	76	76	152
Average total farm area	91.57	80.71	87.37
Less unproductive area	6.29	4.47	5.59
Productive area	85.28	76.24	81.78
Less estimated non-dairying area	4.00	5.59	4.49
Plus estimated 'grazing out' area	2.35	1.65	2.08
Estimated dairy productive area[a] utilized for milk production.	83.63	72.30	79.37

[a]Hereafter abbreviated to dairy productive area.

TABLE 8a

Average Area of Town Supply Farms

by Region and Quota Group

	North Island (ha)			South Island (ha)		
	200-600 l	601-1000 l	1001 + l	200-600 l	601-1000 l	1001 + l
Number of Farms	30	35	11	37	30	9
Average total farm area	60.93	89.14	148.26	59.99	85.58	140.98
Less unproductive	4.42	5.82	10.42	5.59	3.64	2.74
Productive area	56.51	83.32	137.84	54.40	81.94	138.23
Less estimated non-dairying area	1.81	4.14	6.45	2.67	6.35	13.85
Plus estimated 'grazing out' area	1.19	2.67	3.68	0.71	2.72	2.03
Estimated Dairy productive area utilized for milk production	55.89	81.85	135.07	52.44	78.31	126.41

3.1.2 Run-off Units

A total of 72 farms out of 152 had run-off units. This is a similar result to the previous survey (46 percent). In the North Island 39 farms had run-off units and in the South Island there were 33. The weighted average run-off area for all farms was 26.26 ha. The average run-off area in the North Island was larger (at 29.12 ha) than in the South Island (21.73 ha).

3.1.3 Land Use

Tables 9 and 9a give a summary of the proportions of farm area under various farm uses.

TABLE 9

Utilization of Farm Area by Region

Land Use	North Island	South Island	New Zealand
Proportion of Farm Area under:	%	%	%
Dairy Pasture	87	82	85
Forage Crops	2	6	3
Sheep and Beef Cattle Pasture and Cash Crops	4	6	5
Unproductive Land	7	6	7
Total	100	100	100

TABLE 9a

Utilization of Farm Area
by Region and Quota Group

Land Use	North Island			South Island		
	200-600 l	601-1000 l	1001 + l	200-600 l	601-1000 l	1001 + l
Proportion of Farm Area Under:	%	%	%	%	%	%
Dairy Pasture	88	87	87	80	84	86
Forage Crops	2	1	2	7	5	2
Sheep and Beef Cattle Pasture and Cash Crops	3	5	4	4	7	10
Unproductive Land	7	7	7	9	4	2
Total	100	100	100	100	100	100

3.1.4 Irrigation

In the South Island 50 percent of farms surveyed (36 farms) used irrigation. In the North Island the figure was 10 percent (eight farms).

3.2 Ownership and Land Tenure

Tables 10 and 10a show the distribution of different types of farm ownership. Sole owner operators predominated in the South Island, whereas almost 60 percent of farms in the North Island were owned by partnerships or other types of multiple ownerships.

The distribution of land tenure on the surveyed farms was similar to that recorded in previous surveys.

TABLE 10

Distribution of Different Types of Farm Ownership by Region

Type of Farm Ownership	North Island (% farms)	South Island (% farms)	New Zealand (% farms)
Individual owner	43.4	55.8	48.2
Partnership:			
(i) Husband-wife	35.9	19.6	29.6
(ii) Father-son(s)	1.2	12.0	5.4
(iii) Other family	6.3	5.8	6.1
Family company	9.3	4.0	7.2
Trust	0	0	0
Other ownership	3.9	2.8	3.5
Total	100.0	100.0	100.0

TABLE 10a.

Distribution of Different Types of Farm Ownership
by Region and Quota Group

Type of Farm Ownership	North Island			South Island		
	200-600 l (% farms)	601-1000 l (% farms)	1001 + l (% farms)	200-600 l (% farms)	601-1000 l (% farms)	1001 + l (% farms)
Individual owner Partnership:	50.0	37.1	45.5	67.6	56.7	11.1
(i) Husband-wife	40.0	45.7	9.1	24.3	16.7	11.1
(ii) Father-son(s)	3.3	0	0	5.4	16.7	22.2
(iii) Other family	3.3	2.9	18.2	0	3.3	33.3
Family Company	3.3	14.3	9.1	0	6.7	11.1
Trust	0	0	0	0	0	0
Estate	0	0	0	0	0	0
Other ownership	0	0	18.2	2.7	0	11.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

3.3 Labour

The average survey farm for 1976-77 employed a total of 2.13 labour units of which 1.50 units was family labour and 0.62 units non-family labour (Table 11). North Island farms employed slightly more labour on average than South Island farms and a lower proportion of family labour. For both North and South Islands larger quota sizes (Table 11a) were associated with more total labour units and lower proportions of family labour.

TABLE 11

Labour Units per Farm by Region

Type of Labour	North Island	South Island	New Zealand
Farmer	0.89	0.99	0.93
Permanent family	0.31	0.44	0.36
Casual family	0.19	0.25	0.21
Total family labour units	1.39	1.68	1.50
Permanent non-family	0.69	0.33	0.55
Casual non-family	0.08	0.06	0.07
Total non-family labour units	0.77	0.39	0.62
Total labour units	2.16	2.07	2.13
Proportion of permanent labour (%)	88	85	86
Proportion of family labour (%)	64	81	70

TABLE 11a

Labour Units per Farm by Region and Quota Group

Type of Labour	North Island			South Island		
	200-600 l	601-1000 l	1001+l	200-600 l	601-1000 l	1001+l
Farmer	0.89	0.91	0.87	1.00	0.98	1.00
Permanent family	0.24	0.21	0.64	0.24	0.58	0.75
Casual family	0.23	0.20	0.12	0.31	0.21	0.18
Total family labour units	1.36	1.32	1.63	1.55	1.77	1.93
Permanent non-family	0.20	0.64	1.64	0.11	0.33	1.08
Casual non-family	0.09	0.06	0.09	0.04	0.10	0.06
Total non-family labour units	0.29	0.70	1.73	0.15	0.43	1.14
Total labour units	1.65	2.02	3.36	1.70	2.20	3.07
Proportion of permanent labour (%)	81	87	94	79	86	92
Proportion of family labour	82	65	49	91	80	63

3.4 Milk Production

Daily quotas per farm for the 1976-77 year averaged 766 litres, compared with the previous survey estimate of 726 litres and an actual national average figure for direct quota holders of 735 litres.

The average quantity of milk sold for town supply was 312,850 litres, compared with 294,792 litres for the 1975-76 survey (an increase of over six percent).

The average South Island producer in both years produced more milk in litres per cow than his North Island counterpart. The South Island average increased slightly from 4,222 litres per cow to 4,280. The North Island average increased from 3,474 to 3,720 litres per cow. Production per hectare and per labour unit, however, was higher on North Island farms.

TABLE 12

Milk Production

Milk Production	North Island	South Island	New Zealand
Daily quota (l)	831	664	766
Milk production sold for town supply (l)	340,433	296,196	312,850
Milk Production sold for factory supply	138,669	92,854	120,903
Total milk production	479,102	362,050	433,752
Proportion of total production sold for factory supply	29.9%	24.9%	27.9%
Proportion of total production sold for town supply	70.1%	75.1%	72.1%
Average herd size (No. cows)	128.8	84.6	111.7
MILK PRODUCTION:			
litres/cow	3,720	4,280	3,883
l/total ha	5,332	4,486	4,965
l/prod. ha	5,618	4,749	5,304
l/dairy prod. ha	5,729	5,008	5,465
l/labour unit	221,806	174,903	203,639
l/farm/day	1,313	992	1,188

CHAPTER 4

FINANCIAL DATA

4.1 Introduction

Most information contained in this section is presented in the form of tables in which averages are given on a per farm, per cow and on a per total hectare basis.

The reliability of the survey estimates are presented in Appendix C. Comparisons with previous years' results are presented in Appendix H.

4.2 Capital Structure

The procedures adopted in assessing the capital value of assets and liabilities are similar to previous surveys and are presented in Appendix B.

The value of all assets on the average survey farm was $248,959, up nine percent from the previous year. The items, sundry debtors and cash at the bank increased by the greatest relative amount from the previous year, up 89 percent and 63 percent respectively (Table 13).

Current liabilities per farm increased by 40 percent and fixed liabilities by 26 percent compared with the previous year.

The breakdown of capital structure by region and quota size is listed in Appendix D.

TABLE 13

Capital Structure - Value of all Assets and Liabilities[a], 1976-77.

	North Island			South Island			New Zealand		
	Per farm	Per cow	Per total ha	Per farm	Per cow	Per total ha	Per farm	Per cow	Per total ha
Number of farms	73	73	73	74	74	74	147	147	147
ASSETS	$	$	$	$	$	$	$	$	$
Land	213,651	1,659	2,333	140,605	1,662	1,742	185,353	1,659	2,121
Improvements	993	8	11	766	9	9	905	8	10
Farmer's House (¼)	3,836	30	42	2,623	31	32	3,366	30	39
Other Farm Houses	6,866	53	75	2,977	35	37	5,358	48	61
Farm Buildings	7,293	57	80	10,146	120	126	8,400	75	96
Plant & Equipment	4,744	37	52	5,852	69	73	5,173	46	59
Farm Vehicles	5,968	46	65	6,725	79	83	6,261	56	72
Dairy Stock	23,559	183	257	16,011	189	198	20,633	185	236
Other Stock	765	6	8	1,536	18	19	1,064	10	12
Company Shares	1,246	10	14	1,060	13	13	1,174	11	13
Working Capital	2,742	21	30	2,274	27	28	2,560	23	29
Total Farm Assets	271,662	2,109	2,967	190,575	2,253	2,362	240,247	2,150	2,750
Sundry Debtors	4,891	38	53	4,599	54	57	4,777	43	55
Cash at Bank etc.	4,206	33	46	3,513	42	44	3,935	35	45
Total All Assets	280,758	2,180	3,066	198,687	2,349	2,462	248,959	2,229	2,849

[a] A total of five survey farms have been eliminated from these calculations because they employed significant areas of rented land for which valuations were not available.

TABLE 13 (cont.)

Capital Structure - Value of all Assets and Liabilities[a], 1976-77.

	North Island			South Island			New Zealand		
	Per farm	Per cow	Per total ha	Per farm	Per cow	Per total ha	Per farm	Per cow	Per total ha
Number of farms	73	73	73	74	74	74	147	147	147
LIABILITIES	$	$	$	$	$	$	$	$	$
Current Liabilities	10,837	84	118	7,803	92	97	9,659	86	111
Fixed Liabilities	60,043	466	656	49,197	582	610	55,848	500	639
Total Liabilities	70,880	550	774	57,000	674	706	65,507	586	750
Specific Reserves	269	2	3	316	4	4	287	3	3
Capital (Net Worth)	209,609	1,627	2,289	141,371	1,672	1,752	183,165	1,640	2,096
Total	280,758	2,180	3,066	198,687	2,349	2,462	248,989	2,229	2,849

[a] A total of five survey farms have been eliminated from these calculations because they employed significant areas of rented land for which valuations were not available.

4.3 Gross Farm Revenue

Total gross revenue for the average New Zealand farm surveyed increased by 22 percent. In the North Island the average farm increased gross revenue by 28 percent while the average South Island farm showed a smaller increase of 13 percent (Table 14).

Milk sales represented 87.8 percent of total revenue for the average farm. The average New Zealand figure of $41,218 per farm was a 20 percent increase over the previous survey. Profit from livestock sales was the next highest revenue earner per farm. In the 1976-77 year it increased 49 percent to $3,599 for the average farm. This overall increase was due to the large increase in the North Island from $1,952 to $4,063 per farm. The average South Island farm showed a slight drop of two percent for livestock profit. The standard values for all livestock were the same as in the previous survey.

All other revenue terms except rent and lease fees increased for the average farm.

Appendix D lists the gross farm revenue of survey farms by region and quota size.

TABLE 14

Gross Revenue, 1976-77

	North Island			South Island			New Zealand		
	Per farm	Per cow	Per total ha	Per farm	Per cow	Per total ha	Per farm	Per cow	Per total ha
	$	$	$	$	$	$	$	$	$
Milk sales	45,044	349.72	491.91	35,167	415.69	435.72	41,218	369.01	471.76
Produce sold	231	1.79	2.52	614	7.26	7.61	380	3.40	4.35
Wool & skins sold	149	1.16	1.63	262	3.10	3.25	193	1.73	2.21
Contracting fees	159	1.23	1.74	361	4.27	4.47	237	2.12	2.71
Rent & lease fees	320	2.48	3.49	172	2.03	2.13	263	2.35	3.01
Employee's house	901	7.00	9.84	496	5.86	6.15	744	6.66	8.52
Livestock profit	4,063	31.55	44.37	2,867	33.89	35.52	3,599	32.22	41.19
Other revenue	362	2.81	3.95	260	3.07	3.22	322	2.88	3.69
Gross Revenue	51,228	397.73	559.44	40,198	498.05	498.05	46,955	420.37	537.43

4.4 Farm Expenditure

Total expenditure per farm increased from $27,170 to $33,462, a 23 percent increase (Table 15). Administrative expenses increased by 39 percent, labour expenses increased by 35 percent, operating expenses increased by 30 percent, and overheads rose by 16 percent. Net depreciation, however, dropped by 15 percent for the average New Zealand farm.

The large increase in administration expenses from $727 to $1,011 per farm was principally due to the increase in general administration (up 72 percent).

Labour expenses per farm increased from $5,680 to $7,664 or 35 percent.

Among the operating expenses, feed increased by 56 percent to $3,058; grazing expenses also increased by 56 percent; power increased by 49 percent and breeding and herd testing increased 37 percent. Both contracting and weed and pest control were less than for the previous survey.

A breakdown of farm expenditure by region and quota size is listed in Appendix D.

TABLE 15

Farm Expenditure 1976-77

Expenses	North Island Per farm	North Island Per cow	North Island Per total ha	South Island Per farm	South Island Per cow	South Island Per total ha	New Zealand Per farm	New Zealand Per cow	New Zealand Per total ha
LABOUR	$	$	$	$	$	$	$	$	$
Family Labour	1,617	12.55	17.66	1,992	23.55	24.68	1,763	15.78	20.18
Family Casual Labour	519	4.03	5.67	753	8.90	9.33	610	5.46	6.98
Non-Family Permanent & Casual Labour	3,782	29.36	41.30	1,817	21.48	22.51	3,020	27.04	34.57
Unpaid Family Labour	1,023	7.94	11.17	1,298	15.34	16.08	1,130	10.12	12.93
Labour Accommodation	1,284	9.97	14.02	914	10.80	11.32	1,141	10.21	13.06
Sub-total Labour	8,226	63.87	89.83	6,773	80.06	83.92	7,664	68.61	87.72
OPERATING									
Contracting	486	3.77	5.31	780	9.22	9.66	600	5.37	6.87
Animal Health	974	7.56	10.64	642	7.59	7.95	845	7.56	9.67
Breeding & Herd Testing	628	4.88	6.86	519	6.13	6.43	586	5.25	6.71
Shed Expenses	591	4.59	6.45	601	7.10	7.45	595	5.33	6.81
Power	866	6.72	9.46	594	7.02	7.36	761	6.81	8.71
Feed	3,181	24.70	34.74	2,863	33.84	35.47	3,058	27.38	35.00
Fertilizer & Seed	2,842	22.07	31.04	1,591	18.81	19.71	2,357	21.10	26.98
Weed & Pest Control	175	1.36	1.91	190	2.25	2.35	181	1.62	2.07
Vehicle Exps.	2,797	21.72	30.54	2,719	32.14	33.69	2,767	24.77	31.67
Grazing Exps.	583	4.53	6.37	179	2.12	2.22	426	3.81	4.88
Freight	304	2.36	3.32	540	6.38	6.69	396	3.55	4.53
Repairs & Maintenance	3,274	25.42	35.75	2,126	25.13	26.34	2,830	25.34	32.39
Irrigation Exps.	64	0.50	0.70	293	3.46	3.63	153	1.37	1.75
Sub-total Operating	16,766	130.17	183.09	13,637	161.19	168.96	15,554	139.25	178.02
Total Labour and Operating	24,991	194.03	272.92	20,411	241.26	252.89	23,218	207.86	265.74

Table continues on next page.

TABLE 15 (cont.)

Farm Expenditure 1976-77

Expenses Cont.	North Island			South Island			New Zealand		
	Per farm	Per cow	Per total ha	Per farm	Per cow	Per total ha	Per farm	Per cow	Per total ha
ADMINISTRATION	$	$	$	$	$	$	$	$	$
Accountancy	338	2.62	3.69	288	3.40	3.57	318	2.85	3.64
Telephone	245	1.90	2.68	185	2.19	2.29	222	1.99	2.54
General Administration	384	2.98	4.19	608	7.19	7.53	471	4.22	5.39
Sub-total Administration	966	7.50	10.55	1,081	12.78	13.39	1,011	9.05	11.57
OVERHEADS									
Insurance	550	4.27	6.01	480	5.67	5.95	523	4.68	5.99
Interest	3,923	30.46	42.84	3,893	46.02	48.23	3,912	35.02	44.78
Rates	892	6.93	9.74	700	8.27	8.67	818	7.32	9.36
Rent	1,531	11.89	16.72	882	10.43	10.93	1,280	11.46	14.65
Sub-total Overheads	6,897	53.55	75.32	5,956	70.40	73.80	6,533	58.49	74.77
Total Cash Expenses	32,854	255.08	358.79	27,410	324.00	339.61	30,747	275.26	351.92
Net Depreciation	2,695	20.92	29.43	2,744	32.44	34.00	2,715	24.31	31.07
Total Expenditure	35,549	276.00	388.22	30,154	356.43	373.61	33,462	299.57	382.99

4.4.1 Depreciation of Farm Assets

Net depreciation (Table 16) for the latest survey was lower for both the average North Island and South Island farm. For both Islands there was a fall in gross depreciation for plant and equipment and also vehicles. There was a slight increase in gross depreciation on buildings.

Appendix D has details of depreciation by region and quota size.

TABLE 16

Depreciation of Farm Assets

Type of Asset	North Island			South Island			New Zealand		
	Ordinary	First Year & Special	Gross Depreciation	Ordinary	First Year & Special	Gross Depreciation	Ordinary	First Year & Special	Gross Depreciation
	$	$	$	$	$	$	$	$	$
Plant & Equipment	502	493	995	534	494	1,028	514	494	1,008
Vehicles	978	632	1,609	1,060	810	1,870	1,010	700	1,710
Buildings	810	(391)[a]	810	582	(461)[a]	582	722	(418)[a]	722
Gross Depreciation	2,291	1,125	3,416	2,176	1,204	3,480	2,246	1,194	3,440
Less Personal (½) Depn. on cars			296			229			270
Less Depn. recovered on Plant & Vehicles by sales			425			506			456
Net Depn.			2,695			2,744			2,715

[a] Special and First Year Depreciation on buildings is excluded in calculating Gross Depreciation.

4.5 Farm Income

4.5.1 Net Farm Income

Net farm income averaged $13,493 in 1976-77, an increase of $2,150 or 19 percent compared with the previous survey.

The average North Island farm had an increase of 30 percent in net farm income. The average North Island farmer was able to increase his gross farm income at a slightly faster rate (up 28.2 percent) than the increase in his total expenses (up 27.5 percent). In the South Island the average farmer failed to increase his gross income (up 13.3 percent) as quickly as the increase in his farm expenses (up 17.4 percent). The result for the average South Island farmer surveyed was a smaller increase in net income of 2.5 percent.

The net farm income is broken down by region and quota size in Appendix D.

TABLE 17

Net Farm Income, 1976-77

	North Island			South Island			New Zealand		
	Per farm $	Per cow $	Per total ha $	Per farm $	Per cow $	Per total ha $	Per farm $	Per cow $	Per total ha $
Gross Farm Income	51,228	397.73	559.44	40,198	475.15	498.05	46,955	420.37	537.43
Total Expenditure	35,549	276.00	388.22	30,154	356.43	373.61	33,462	299.57	382.99
Net Income	15,679	121.73	171.22	10,044	118.72	124.44	13,493	120.80	154.44

4.5.2 Cash Incomes

Table 18 shows the cash surplus available to farmers after the year's farming. Imputed costs such as allowances for the employee's house are excluded. Taxation has not been deducted.

The average New Zealand farm had a 19 percent increase in cash surplus from farming compared with the previous year. This percentage increase is the same as the net income increase.

TABLE 18

Cash Surplus From Farming
($ per farm)

	North Island	South Island	New Zealand
1. Cash Received:			
Milk Sales	45,044	35,166	41,218
Dairy Cattle Sales	3,326	2,695	3,081
Sheep & Beef Sales	600	1,054	776
Bobby Calf Sales	1,072	459	834
Other Farm Income	1,220	1,669	1,394
Total	51,262	41,043	47,303
2. Cash Spent:			
Labour & Operating	22,685	18,199	20,947
Overheads & Administration	7,863	7,037	7,544
Cattle Purchases	1,583	1,118	1,403
Sheep & Beef Cattle Purchases	116	233	162
Total	32,247	26,587	30,056
CASH SURPLUS FROM FARMING	19,015	14,456	17,247

4.5.3 Farm Incomes at Imputed Interest Rates

Net farm income (Table 17) is calculated on an actual interest paid basis.

The previous survey applied varying rates of imputed interest to both the net worth of the farmer and the total value of farm assets. This was done to standardise the procedure of calculating farm incomes.

In Table 19 an imputed interest (e.g. 3.5 percent)

TABLE 19

Net Farm Income at Imputed Interest on Net Worth and Total Assets
($ per farm)

	North Island	South Island	New Zealand
Number of farms	73	74	147
Net Worth or Capital	209,609	141,371	183,165
Net Income	15,679	10,044	13,493
A. Interest rate applied on Net Worth:			
3½%	8,343	5,094	6,987
5%	5,199	2,975	4,240
7%	1,006	148	577
Total Farm Assets	280,758	198,687	248,959
Net Income	15,679	10,044	13,493
Interest Paid	3,923	3,893	3,912
B. Interest rate applied on Total Assets:			
3½%	9,775	6,983	8,938
5%	5,564	4,003	5,334
7%	-51	29	529

Note: A total of five survey farms have been eliminated from these calculations because they employed significant areas of rented land for which valuations were not available.

is applied to the net worth of the farmer. This figure is then deducted from the net farm income. The actual interest paid on outstanding farm debt is left in as an expense. A similar approach is used with the total value of farm assets except that the actual interest paid is added back onto the net farm income prior to deducting the imputed interest on the total value of farm assets.

4.5.4 Measures of Economic Profitability

The calculated rate of return on farm capital for the average New Zealand farm was 4.31 percent. The figure for the previous year was 3.97 percent. The capital turnover percentage over all farms increased from 17.40 in 1975-76 to 19.45. The labour and management residual increased from -$1,057 to $336 per farm (Table 20).

These measures of economic profitability are the same as those applied to the N.Z. Meat and Wool Boards' Economic Service "Sheep and Beef Farm Survey, 1975-76" Report. Definitions of terms used are given in Appendix B.

TABLE 20

Measures of Economic Profitability

	North Island	South Island	New Zealand
Number of farms	73	74	147
A. RETURN ON CAPITAL	$	$	$
1. Working Expenses (Labour & Operating Expenses)	22,719	18,124	20,940
2. Plus assessed Managerial Reward	8,665	7,824	8,339
3. Total adjusted Working Expenses (1+2)	31,384	25,948	29,279
4. Working Capital	2,742	2,274	2,560
5. Farm Capital	267,374	182,366	234,437
6. TOTAL FARM CAPITAL (4+5)	270,116	184,640	236,997
7. Net Farm Income	15,679	10,044	13,493
8. Plus Interest Paid	3,923	3,893	3,912
9. Plus Rent Paid	1,531	882	1,280
10. Sub-total (7+8+9)	21,133	14,819	18,685
11. Less assessed Managerial Reward (2)	8,665	7,824	8,339
12. Economic Farm Surplus (10-11)	12,468	6,995	10,225
13. Rate of Return % (12/6)	4.62	3.79	4.31
B. CAPITAL TURNOVER PERCENTAGE			
14. Gross Farm Income	50,125	39,711	46,091
15. Total Farm Capital (6)	270,116	184,640	236,997
16. Capital Turnover Percentage (14/15)	18.56	21.51	19.45
C. LABOUR & MANAGEMENT RESIDUAL			
17. Total Farm Capital (6)	270,116	184,640	236,997
18. Plus Cash at Bank	4,206	3,513	3,935
19. Sub-total (17+18)	274,322	188,153	240,932
20. Less Fixed Liabilities	60,043	49,197	55,848
21. Less Current Liabilities	10,837	7,803	9,659
22. TOTAL EQUITY CAPITAL (19-20-21)	203,442	131,153	175,425
23. Net Farm Income (7)	15,679	10,044	13,493
24. Less 7.5% of Equity Capital (22)	15,258	9,836	13,157
25. Labour & Management Residual (23-24)	421	208	336

Note: Five farms have been excluded from these calculations because they employed significant areas of rented land.

4.6 Relative Importance of Principal Revenue and Expenditure Components

Milk sales represented 86 percent of total revenue in the 1975-76 survey, in the current survey they increased to 87.8 percent.

Operating expenses increased from 43.9 percent to 46.5 percent of total expenditure. The next two most important expenditure sub-groups were labour and overhead expenses.

TABLE 21

Revenue and Expenditure Components

	North Island	South Island	New Zealand
	%	%	%
Gross Revenue			
Milk Sales	87.9	87.5	87.8
Livestock Profit	7.9	7.1	7.7
Other Revenue	4.2	5.4	4.5
Total	100.0	100.0	100.0
Expenditure			
Labour	23.1	22.5	22.9
Operating	47.1	45.3	46.5
Administration	2.7	3.6	3.0
Overheads	19.4	19.8	19.5
Depreciation	7.6	9.0	8.1
Total	100.0	100.0	100.0
Expenditure/Revenue Ratio %	69.4	74.9	71.2

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APPENDIX A

PRODUCER ASSOCIATIONS INCLUDED IN SURVEY

North Island

Whangarei Milk Marketing Co. Ltd.
North Shore Co-op Milk Producers Ltd.
Auckland Co-op Milk Producers Ltd.
The New Zealand Co-op Dairy Co. Ltd. (Ambury's), Auckland.
Franklin Co-op Milk Producers Ltd.
Thames Valley Milk Producers Ltd.
Hamilton Milk Producers 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.
Hawke's 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 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 Ltd.
Canterbury Dairy Farmers Ltd.
Metropolitan Milk Ltd.
Ashburton Town Milk Producers Co-op. Ltd.
South Canterbury Co-op Milk Supply Co. Ltd. (Timaru).
North Otago Co-op Milk Supply Co. Ltd.
Dunedin Dairy Farmers Co-op Milk Supply Co. Ltd.
Southland Co-op Milk Producers Assn. Ltd. (Invercargill).

Source: N.Z. Milk Board.

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 and assembling data from each farm:

TOTAL FARM AREA: This was the total area farmed by the producer during the 1976-77 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 that land to which stock had regular access. It was the area grazed by stock plus 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 total farm area.

LABOUR UNIT: 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. Cadet and student workers were assessed according to the amount of useful work carried out.

VALUE OF LABOUR UNIT: A standard wage of $6,000 per annum, with or without the provision of a house, was assumed for the imputed wage of male workers over 17 years; the imputed wage assumed for women and 12 - 17 yr. youths was $5,200 per annum. The standard wage for male workers in the 1974-75 survey was $5,100 and $4,600 for women and 12 - 17 year old youths.

HOUSE RENT FOR EMPLOYEES: Where a house was provided by the farmer for an employee (including other family members), the rental was assumed to be a fair rental for the district. The average rental was between $25 - $30 per week.

FULL BOARD AND LODGING: This was assessed at $17 per week per person; this represented an increase of $2 per week compared with the previous survey.

PRODUCE USED: A 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 included in labour accommodation expenses. The 1975-76 value for produce used was $165.

LAND VALUES: The most recent Government valuation for each land assessment was obtained. The Valuation Department's "Farmland Sales Price Index" (base year 1960) was used to update all land assessments to 1977 values. To obtain a value for land only, the total opening book value of all farm buildings was deducted from the "updated" capital value of the farm.

DEPRECIATION OF FARM BUILDINGS: The opening book values of all farm buildings were used to determine depreciation. Ordinary depreciation rates were applied (i.e. no special depreciation allowances) to the book values. The normal 2.5 percent depreciation rate was applied to opening book values of all houses on the farm except that rates were applied to only one quarter of the book value of the farmer's dwelling.

DEPRECIATION OF OTHER ASSETS: Depreciation on all other capital items except farm buildings was based on rates used for taxation purposes. All personal allowances for depreciation (e.g. motor car), were deducted from the gross depreciation.

WORKING CAPITAL: Working capital was calculated by dividing the total expenses on each farm by 12. Hence, cash expenses for a month were considered equivalent to the annual working capital for the farm.

DEVELOPMENT EXPENDITURE: Certain capital expenditures may be treated as expenses for income tax purposes. The deduction of these expenses for tax purposes may be deferred, either in whole or in part, for up to nine years, and includes, inter alia, expenditures on the following:

(i) Eradication of animal and vegetable pests
(ii) Construction of fences
(iii) Construction of roads, access tracks, and topdressing landing strips
(iv) Sinking of bores and the construction of dams
(v) Swamp drainage.

Fertiliser expenditure may also be deferred for up to four years. All development expenditure that was included in the farm operating expenses was isolated and deducted from the relevant expenditure item. Development expenditure has been included in the farm assets.

QUOTA: This was the average daily quota per farm for the 1975-76 income year.

STANDARD VALUES USED IN THE VALUATION OF LIVESTOCK: Numbers of dairy 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
Heifers	$ 80		
Yearlings	$ 50		
Calves	$ 20		

Sheep:

Ewes	$17	Wethers	$12
Hoggets - ewe	$15	Rams	$50
- ram	$30		
- wether	$15		

Beef Cattle:

Cows	$100	Steers - calves	$ 60
Heifers-calves	$ 60	- 1 yr.	$ 80
- 1 yr.	$ 80	- 2 yr.	$120
- 2 yr.	$120	Bulls - calves	$100
		- other	$300

The standard values applied to dairy stock were the same as for the 1975-76 survey. However, for 1975-76 all sheep were valued at $5 and all beef cattle at $100.

MILK GRADES are defined by 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 percent fat for town milk, does not fall below 3.5 percent 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 percent fat but not 3.5 percent fat.
Second Grade: For milk which fails to pass a three-hour reductase test and/or contains less than 3.25 percent fat.

INCOME:

TOTAL 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 Producer 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 these items.

CONTRACTING: Gross proceeds from contracting work undertaken by the farmer or his employees; fencing, hay baling, bulldozing etc.

RENT AND LEASE FEES: Grazing fees and rent received from farm cottages or land.

EMPLOYEE'S HOUSE AND PRODUCE: This value is the sum of the annual imputed rental value of the farm employee's house(s) and the $190 per annum allowance for each married non-family permanent worker for produce used.

LIVESTOCK PROFIT: Net 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: Sale of timber, posts, and sundry items, and interest from Dairy Company shares and investments.

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

EXPENDITURE:

FAMILY LABOUR: Actual wages paid to permanent family members. Does not include end of year bonuses etc.

FAMILY CASUAL LABOUR: Wages paid to all family members for casual work during the year. Wives that were only involved occasionally in farm work, but who claimed wages for taxation purposes were included in this category.

NON FAMILY LABOUR: Wages paid to permanent non-family members. Payments for Accident Compensation are included in this amount.

NON FAMILY CASUAL LABOUR: Casual wages paid for relief milking, casual feeding, hay making etc. during the year. Contractors work is excluded.

UNPAID FAMILY LABOUR: The value of unpaid family labour was assessed as follows:
Men and Youths over 17 years of age: $2.30 per hour (increased from $1.95 in 1974-75)
12-17 year old youths, women, and aged people: $1.53 per hour (increased from $1.30 in 1974-75).
Children under 12 years: Nil.

LABOUR ACCOMMODATION: This was calculated as the sum of the imputed rental value of farm cottage(s) per annum and $190 per annum for produce used by non-family permanent worker(s).

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, facial eczema control and various testing fees.

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.

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

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

FERTILISER AND SEED: Includes cost of fertiliser and seed, freight and spreading charges. Subsidies and rebates have been deducted.

WEED AND PEST CONTROL: This amount includes cost of materials and some spraying work. In some cases the cost of spraying work is included in contracting expenses.

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

GRAZING EXPENSES: Grazing fees incurred during the year.

REPAIRS AND MAINTENANCE: Repairs to buildings, plant, fences, water supply, races, etc.

IRRIGATION EXPENSES: Repairs to irrigation equipment and imputed values for power and vehicle costs.

ACCOUNTANCY: Accountancy fees paid on all farm accounts.

TELEPHONE: Postage, telephone rentals and tolls.

GENERAL ADMINISTRATION: Items not allocated elsewhere. e.g. Farm advisory services, legal fees, subscriptions, travelling expenses and sundry items.

INSURANCE: General insurance of farm assets: accident compensation levy is included in labour expenses.

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

RENT: Fees paid for Crown lease or short-term renting. Excludes all internal rents paid to trust and companies etc.

NET DEPRECIATION: Includes all special and ordinary depreciation less personal allowances, 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.

NET CASH INCOME: This is the difference between the gross farm revenue and total cash expenses (excludes depreciation).

CAPITAL STRUCTURE:

SUNDRY DEBTORS: Average value of general sundry debts to the farm account. The majority of this amount is monthly milk payments due from the Producer Companies.

CASH IN BANK etc.: Average value of all current accounts held at Banks and Commercial firms for the farm's financial year.

TOTAL ALL ASSETS: The sum of all current and long term farm assets.

CURRENT LIABILITIES: Average balance owing on general sundry creditors, hire purchase, short term loans and bank overdrafts.

FIXED LIABILITIES: Average balance owing on all long term mortgages and loans.

TOTAL LIABILITIES: Sum of current and fixed liabilities.

SPECIFIC RESERVES: Examples of these are taxation monies, development reserves and income equalisation funds. The total specific reserves per farm were partly estimated.

CAPITAL (NET WORTH): This value is obtained by subtracting the value of total liabilities and specific reserves from the total value of all assets.

TOTAL LIABILITIES AND NET WORTH = TOTAL ALL ASSETS.

TERMS USED IN MEASURES OF ECONOMIC PROFITABILITY[1]

WORKING EXPENSES: Cash payments for labour (excludes imputed values), operating and administrative expenses.

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[1]Source: N.Z. Meat and Wool Boards' Economic Service, 'Sheep and Beef Farm Survey' 1974-75.

ASSESSED MANAGERIAL REWARD: This is an assessment of the payment that should be imputed to an owner-operator for his/her own labour and management skill. Calculated by adding $6,000 (imputed value fo farm worker's wage) and one percent of Farm Capital.

WORKING CAPITAL: This is estimated to be one twelth 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 percent 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 $2,300)and all livestock.

TOTAL FARM CAPITAL: This is the sum of Working and Farm Capital.

MANAGERIAL SALARIES: This is an average assessed value of all managerial salaries paid.

INTEREST PAID: This is the actual average interest paid.

RENT PAID: This is the actual average 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 Farm Income 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/her own labour and management, if a 7½ percent interest (similar to Economic Service Report) is applied to his/her own equity capital, in addition to the interest already paid on borrowed capital. A sum of 7½ percent of the calculated Equity Capital is subtracted from the sum of Net Farm Income and Managerial Salaries paid.

APPENDIX C

RELIABILITY OF SURVEY ESTIMATES

Due to sampling error, 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 the 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. 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 22 sets out the mean and relative standard error for key survey variables. The relative standard error may be interpreted as follows. Table 22 shows that for New Zealand the survey estimate of average net farm income was $13,504 with a relative standard error (RSE) of 4.61 percent. In other words it is 95 percent certain that the true value of average net farm income lies within the range 1.96 x 4.61 percent x $13,504 either side of the estimated value. That is within $13,504 $\pm$ 1220. Relative standard errors of estimates of the means for the various strata are larger than for the New Zealand estimates because the sample size is smaller. Hence more caution should be exercised in making inferences for the individual strata.

TABLE 22

Reliability of Survey Estimates

Variable	North Island Quota Size (litres)				South Island Quota Size (litres)				New Zealand
	200-600	601-1000	1000+	All	200-600	601-1000	1000+	All	
Herd Size									
- mean (cows)	90.65	119.00	213.23	128.83	64.30	91.82	137.22	84.66	117.70
- RSE (%)	6.25	4.84	7.75	3.93	4.37	5.79	5.87	3.38	2.79
Quota									
- mean (litres)	446.97	800.71	1538.91	830.57	466.65	736.47	1169.67	664.42	766.13
- RSE (%)	4.26	3.92	9.51	4.54	4.41	2.46	4.00	2.55	3.15
Total Farm Area									
- mean (hectares)	60.94	89.14	148.26	91.58	59.99	85.58	140.98	80.71	87.37
- RSE (%)	7.78	10.18	10.87	5.60	7.07	6.17	11.16	4.67	4.27
Total Milk Production									
- mean (litres)	304636	464625	803084	479102	264354	404394	593124	362051	433753
- RSE (%)	4.10	4.80	8.48	4.00	5.80	5.28	5.54	3.52	2.97
Gross Revenue									
- mean ($)	31729	48244	90208	51228	26807	44937	74792	40198	46955
- RSE (%)	4.66	3.66	8.87	4.10	4.80	3.68	4.70	3.02	2.94
Total Expenditure									
- mean ($)	21638	32799	64667	35549	20062	34332	54260	30154	33462
- RSE (%)	5.90	6.09	10.11	5.07	6.08	5.39	7.31	3.89	3.58
Net Farm Income									
- mean ($)	10091	15445	25541	15679	6745	10605	20532	10044	13493
- RSE (%)	11.58	7.33	10.56	5.67	12.71	12.50	11.62	7.48	4.61

Estimation Mathematics[2]

In addition to forming the usual survey 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, $N = \Sigma N_h$, $N^* = \Sigma N_h^*$

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_h (known)

c_h - the number of eligible farms (farmers) who declined to provide data (known).

π_h = N_h^* / N^*, the fraction of eligible farms in the total population coming from stratum h.

$\bar{\mu}_h$, σ_h^2 - the unkown 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.

$\bar{\bar{\mu}}$ = $\Sigma \pi_h \bar{\mu}_h$, the unknown mean of the characteristic under study over all eligible units.

$\bar{\bar{x}}$ - the sample estimate of $\bar{\bar{\mu}}$.

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[2]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:

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

$$\text{est. var. } \hat{W}_h = \frac{\hat{W}_h\ (1 - \hat{W}_h)}{n_h + c_h + m_h - 2} \quad ; \text{ unbiased estimator of the variance of } \hat{W}_h.$$

The estimated stratum size is:

$\hat{N}_h^* = N_h\ \hat{W}_h$ with estimated variance equal to N_h^2 multiplied by est. var. $\hat{W}_h$.

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

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

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

The first term in the equation for estimating the standard error (s.e.) of the survey means 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 23.

TABLE 23

Estimation of Stratum Sizes

Stratum	N_h	n_h	c_h	m_h	$\hat{N}_h^*$	$\hat{\pi}_h^*$
North Island						
201-600 litres	350	30	16	39	187	0.219
601-1000 litres	354	35	13	27	225	0.263
1001+ litres	198	11	9	15	111	0.130
South Island						
201-600 litres	261	37	13	30	162	0.189
601-1000 litres	144	30	4	5	125	0.146
1001+ litres	62	9	3	4	45	0.053
Total N.Z.:	1369	152			855	1.000

APPENDIX D

SURVEY RESULTS BY REGION AND QUOTA GROUP

1. Capital Structure, Assets, Liabilities, Net Worth.
2. Gross Revenue.
3. Depreciation of Farm Assets.
4. Expenditure.
5. Net Farm Income.
6. Cash Surplus.
7. Net Farm Income at Imputed Interest Rates.
8. Measures of Economic Profitability.

TABLE 24

Capital Structure - Value of all Assets, 1976-77
by Region and Quota Group

	North Island			South Island		
	200-100 l	601-1000 l	1001 + l	200-600 l	601-1000 l	1001 + l
Number of Farms	27	35	11	35	30	9
ASSETS	$	$	$	$	$	$
Land	125,245	179,503	432,201	86,316	153,094	299,312
Improvements	844	837	1,562	797	898	292
Farmer's House (¼)	3,413	3,224	5,792	2,472	3,052	1,981
Other Farm Houses	4,378	6,740	11,323	2,018	3,139	5,943
Farm Buildings	6,668	7,032	8,876	7,432	13,255	11,259
Plant & Equipment	3,633	4,464	7,187	3,718	6,398	11,938
Farm Vehicles	4,227	6,834	7,151	5,371	6,783	11,377
Dairy Stock	15,904	22,789	38,049	11,983	17,122	27,277
Other Stock	188	924	1,417	718	1,945	3,323
Company Shares	776	1,026	2,487	864	1,019	1,867
Working Capital	1,662	2,531	4,992	1,520	2,587	4,093
Total Farm Assets	166,939	235,904	521,032	123,168	209,475	378,660
Sundry Debtors	2,342	6,551	5,829	2,295	5,376	10,660
Cash at Bank etc.	4,948	4,668	2,014	2,990	2,484	8,195
Total All Assets	174,229	247,123	528,874	128,453	217,341	397,515

TABLE 25

Capital Structure -

Liabilities and Net Worth, 1976-77.

by Region and Quota Group

	North Island			South Island		
	200-600 l	601-1000 l	1001 + l	200-600 l	601-1000 l	1001 + l
Number	27	35	11	35	30	9
LIABILITIES	$	$	$	$	$	$
Current Liabilities	11,328	10,421	10,853	7,089	7,066	12,366
Fixed Liabilities	37,207	51,983	114,954	35,177	56,984	77,660
Total Liabilities	48,535	62,404	125,807	42,266	64,050	90,026
Specific Reserves	241	265	323	144	624	82
Capital (Net Worth)	125,453	184,453	402,744	86,085	152,478	307,409
Total	174,229	247,123	528,874	128,494	217,152	397,517

TABLE 26

Gross Revenue, 1976-77
by Region and Quota Group

	North Island			South Island		
	200-600 l	601-1000 l	1001 + l	200-600 l	601-1000 l	1001 + l
	$	$	$	$	$	$
Milk Sales	27,669	42,670	79,198	24,062	39,911	61,619
Produce Sold	0	181	722	385	680	1,250
Wool & Skins Sold	161	204	17	277	166	469
Contracting fees	267	125	45	56	260	1,720
Rent & Lease fees	413	141	527	123	136	444
Employee's House	265	740	2,303	121	558	1,656
Livestock Profit	2,623	3,689	7,251	1,500	2,962	7,469
Other Revenue	330	494	147	283	266	164
Gross Revenue	31,729	48,244	90,208	26,807	44,937	74,792

TABLE 27

Depreciation of Farm Assets - North Island

($/farm)

Type of Asset	200 - 600 l Ordinary	200 - 600 l First Year & Special	200 - 600 l Gross Depreciation	601 - 1000 l Ordinary	601 - 1000 l First Year & Special	601 - 1000 l Gross Depreciation	1001 + l Ordinary	1001 + l First Year & Special	1001 + l Gross Depreciation
Plant & Equipment	370	289	659	498	445	943	734	936	1,670
Vehicles	802	388	1,190	956	849	1,805	1,319	602	1,921
Buildings	483	(329)*	483	745	(484)*	745	1,498	(308)*	1,498
Gross Depreciation	1,655	677	2,332	2,199	1,294	3,493	3,551	1,538	5,088
Less Personal Depn. on cars			246			342			285
Less Depn. recovered on Plant & Vehicles by Sales			265			745			45
Net Depn.			1,821			2,406			4,758

TABLE 27 (continued)

Depreciation of Farm Assets - South Island

($/farm)

Type of Asset	200 - 600 l Ordinary	200 - 600 l First Year & Special	200 - 600 l Gross Depreciation	601 - 1000 l Ordinary	601 - 1000 l First Year & Special	601 - 1000 l Gross Depreciation	1001 + l Ordinary	1001 + l First Year & Special	1001 + l Gross Depreciation
Plant & Equipment	337	283	620	600	588	1,188	1,050	986	2,036
Vehicles	695	508	1,203	1,269	548	1,817	1,787	2,603	4,390
Buildings	388	(424)*	388	757	(668)*	757	791	(24)*	791
Gross Depreciation	1,420	791	2,211	2,626	1,136	3,761	3,628	3,589	7,218
Less Personal Depn. on Cars			184			214			432
Less Depn. recovered on Plant & Vehicles by Sales			453			163			1,636
Net Depn.			1,574			3,384			5,150

* Depreciation on farm buildings has not been taken into account.

TABLE 28

Farm Expenditure, 1976-77
by Region and Quota Group

Expenses	North Island			South Island		
	200-600 l	601-1000 l	1001 + l	200-600 l	601-1000 l	1001 + l
Labour	$	$	$	$	$	$
Family Labour	879	1,202	3,706	939	2,585	4,104
Family Casual Labour	419	638	445	715	914	449
Non-family Permanent & Casual Labour	1,141	3,508	8,797	516	1,887	6,247
Unpaid Family Labour	1,362	1,060	376	1,551	1,145	820
Labour Accommodation	556	1,054	2,981	377	1,120	2,256
Sub-total Labour	4,357	7,464	16,305	4,097	7,651	13,876
Operating						
Contracting	339	427	854	379	599	2,699
Animal Health	591	836	1,899	481	738	953
Breeding & Herd Testing	367	666	992	241	676	1,077
Shed Expenses	426	544	965	431	675	999
Power	621	793	1,427	426	681	954
Feed	2,002	2,831	5,884	2,220	3,068	4,584
Fertilizer & Seed	1,594	2,814	5,007	1,003	1,789	3,141
Weed & Pest Control	81	201	283	131	194	388
Vehicle Exps.	1,810	2,614	4,835	2,214	2,952	3,875
Grazing Exps.	199	640	1,114	55	276	354
Freight	199	266	560	323	635	1,047
Repairs & Maintenance	2,028	3,218	5,494	1,366	2,725	3,186
Irrigation Exps.	15	36	205	147	325	722
Sub-total Operating	10,271	15,886	29,518	9,419	15,333	23,979
Total Labour & Operating	14,628	23,349	45,823	13,517	22,984	37,855

TABLE 28 (cont.)

Farm Expenditure, 1976-77
by Region and Quota Group

Expenses Cont.	North Island			South Island		
	200-600 l	601-1000 l	1001 + l	200-600 l	601-1000 l	1001 + l
Administration	$	$	$	$	$	$
Accountancy	263	314	511	211	329	452
Telephone	176	259	335	143	193	312
General Administration	241	367	659	328	682	1,398
Sub-total Administration	680	940	1,504	683	1,203	2,162
Overheads						
Insurance	370	515	923	364	546	714
Interest	2,643	3,463	7,016	2,928	4,633	5,294
Rates	523	916	1,466	557	778	997
Rent	973	1,185	3,175	526	904	2,088
Sub-total Overheads	4,510	6,081	12,581	4,375	6,861	9,093
Total Cash Expenses	19,818	30,370	59,908	18,574	30,947	49,111
Net Depreciation	1,821	2,406	4,758	1,574	3,384	5,150
Total Expenditure	21,638	32,776	64,666	20,148	34,332	54,260

TABLE 29

Net Farm Income, 1976-77
by Region and Quota Group

Net Income Based on Interest Paid	North Island			South Island		
	200-600 l $	601-1000 l $	1001 + l $	200-600 l $	601-1000 l $	1001 + l $
Gross Farm Revenue	31,729	48,244	90,208	26,807	44,937	74,792
Total Expenditure	21,638	32,776	64,666	20,148	34,332	54,260
Net Income	10,091	15,468	25,542	6,659	10,605	20,532

TABLE 30

Cash Surplus From Farming

by Region and Quota Group

($ per farm)

	North Island			South Island		
	200-600 l	601-1000 l	1001 + l	200-600 l	601-1000 l	1001 + l
1. Cash Received:	27,669	42,670	79,198	24,062	39,911	61,619
Dairy Cattle Sales	2,128	3,713	4,563	2,163	2,265	5,771
Sheep & Beef Sales	400	542	1,056	442	1,414	2,238
Bobby Calf Sales	776	1,001	1,715	322	529	753
Other Farm Income	1,170	1,145	1,458	1,124	1,508	4,047
TOTAL	32,143	49,071	87,990	28,113	45,627	74,428
2. Cash Spent:						
Labour & Operating	12,710	21,234	42,466	11,589	20,719	34,779
Overheads & Administration	5,190	7,021	14,086	5,057	8,065	11,255
Cattle Purchases	1,358	1,724	1,679	1,116	1,247	722
Sheep & Beef Cattle Purchases	122	64	213	195	355	35
TOTAL	19,380	30,043	58,444	17,957	30,386	46,841
CASH SURPLUS FROM FARMING	12,763	19,028	29,546	10,156	15,241	27,587

TABLE 31

Net Farm Income at Imputed Interest on

Net Worth and Total Assets

by Region and Quota Group

($ per farm)

	North Island			South Island		
Number of farms	200-600 l 27	601-1001 l 35	1001 + l 11	200-600 l 35	601-1001 l 30	1001 + l 9
Net Worth or Capital	125,453	184,453	402,744	86,085	152,478	307,409
Net Income	9,381	15,445	25,541	7,011	10,605	20,532
A. Interest rate applied on Net Worth:						
3½%	4,990	8,989	11,445	3,998	5,268	9,773
5%	3,108	6,222	5,404	2,707	2,981	5,162
7%	599	2,533	-2,651	985	-68	-987
Total Farm Assets	166,939	235,904	521,032	123,209	209,292	378,662
Net Income	9,381	15,445	25,541	7,011	10,605	20,532
Interest Paid	2,773	3,463	7,016	2,967	4,633	5,294
B. Interest rate applied on Total Assets:						
3½%	6,311	10,651	14,321	5,666	7,913	12,573
5%	3,807	7,113	6,505	3,818	4,773	6,893
7%	468	2,395	-3,915	1,353	588	-680

TABLE 32

Measures of Economic Profitability
by Region and Quota Group

	North Island			South Island		
	200-600 l	601-1000 l	1001 + l	200-600 l	601-1000 l	1001 + l
Number of Farms	27	35	11	35	30	9
A. RETURN ON CAPITAL						
1. Working expenses (Labour & Operating Expenses)	12,807	21,235	42,466	11,435	20,719	34,779
2. Plus assessed Managerial Reward	7,727	8,268	11,054	7,160	8,005	9,684
3. Total adjusted Working Expenses (1+2)	20,534	29,503	53,520	18,595	28,724	44,463
4. Working Capital	1,710	2,458	4,458	1,549	2,393	3,704
5. Farm Capital	175,090	226,823	505,461	116,012	200,517	368,419
6. TOTAL FARM CAPITAL (4+5)	176,800	229,281	509,919	117,561	202,910	372,123
7. Net Farm Income	9,381	15,445	25,541	7,010	10,605	20,532
8. Plus Interest Paid	2,773	3,463	7,016	2,967	4,633	5,294
9. Plus Rent Paid	822	1,185	3,175	375	904	2,088
10. Sub-total (7+8+9)	12,976	20,093	35,732	10,353	16,142	27,914
11. Less assessed Managerial Reward (2)	7,727	8,268	11,054	7,160	8,005	9,684
12. Economic Farm Surplus (10-11)	5,249	11,825	24,678	3,193	8,137	18,230
13. Rate of Return,% (12/6)	2.97%	5.16	4.84	2.72	4.01	4.90
B. CAPITAL TURNOVER PERCENTAGE						
14. Gross Farm Income	30,901	47,504	87,905	26,704	44,379	73,136
15. Total Farm Capital (6)	176,800	229,281	509,919	117,561	202,910	372,123
16. Capital Turnover Percentage (14/15)	17.48%	20.72	17.24	22.72	21.87	19.65
C. LABOUR & MANAGEMENT RESIDUAL						
17. Total Farm Capital (6)	176,800	229,281	509,919	117,561	202,910	372,123
18. Plus Cash at Bank	4,948	4,668	2,014	2,990	2,484	8,195
19. Sub-total (17+18)	181,748	233,949	511,933	120,551	205,394	380,318
20. Less Fixed Liabilities	37,207	51,902	114,954	35,147	57,006	77,660
21. Less Current Liabilities	11,328	10,421	10,853	7,089	7,006	12,366
22. TOTAL EQUITY CAPITAL (19-20-21)	133,213	171,626	386,126	78,315	141,382	290,292
23. Net Farm Income (7)	9,381	15,445	25,541	7,011	10,605	20,532
24. Less 7.5% of Equity Capital (22)	9,991	12,872	28,959	5,874	10,604	21,772
25. Labour & Managerial Residual (23-24)	-610	2,573	-3,418	1,137	-1	-1,240

APPENDIX E

HERD TESTING AND HERD STRUCTURE

As indicated in Table 33 there were 56 percent of farms herd testing in New Zealand. This was a similar result to the last survey.

TABLE 33

Use of Herd Testing

	North Island	South Island	New Zealand
Herd Tested (%)	55	59	56
No Herd Testing (%)	45	41	44
Total	100	100	100

TABLE 33a

Use of Herd Testing by Region and Quota Group

	North Island			South Island		
	200-600 l	601-1000 l	1001 + l	200-600 l	601-1000 l	1001 + l
Herd Tested (%)	50	63	46	51	63	78
No Herd Testing (%)	50	37	54	49	37	22
Total	100	100	100	100	100	100

The dairy stock balance for the average New Zealand farm is listed in Table 34 . The average herd size increased from 105 cows in 1975-76 to 112 cows in 1976-77. The dairy livestock profit also increased from $1,881 to $2,915.

Beef cattle and sheep numbers dropped by 11 percent compared with the previous survey. The livestock profit, however, increased from $385 per farm to $684.

TABLE 34

Dairy Stock Balances

Opening Stock	New Zealand Average No. per Farm	Value $	Closing Stock	New Zealand Average No. per Farm	Value $
All Cows	110	13,842	All Cows	113	14,080
Heifers-in-calf	18	1,862	Heifers-in-calf	19	1,870
1-2 yr. Heifers	11	778	1-2 yr. Heifers	11	792
Yearlings	14	673	Yearlings	15	735
Calves	19	385	Calves	20	414
Bull Calves	1	51	Bull Calves	1	89
Bulls	2	446	Bulls	2	464
Sub-total	175	18,037	Sub-total	181	18,450
Purchases			Sales		
Cows	5	917	Cows	23	2,506
Other Dairy	5	485	Other Dairy	5	570
Calves Reared	27	-	Deaths, Killers, etc.	3	-
Opening Total	212	19,439	Bobby Calves Sold	(58)*	834
Livestock Profit		2,915			
Opening Balance	212	22,354	Closing Balance	212	22,354

*Figures in brackets have not been included in stock balance.

TABLE 35

Beef and Sheep Stock Balances for all Farms

New Zealand					
Opening Stock	Average No. per farm	Value $	Closing Stock	Average No. per farm	Value $
All Sheep	25	410	All Sheep	26	416
All Beef Cattle	5	412	All Beef Cattle	5	476
Sub-Total	30	822	Sub-Total	31	892
Purchases	11	162	Sales	34	776
Reared Replacements	25	-	Deaths, Killers, etc.	1	-
Livestock Profit	-	684			
Opening Balance	66	1,668	Closing Balance	66	1,668

APPENDIX F

SHED TYPES AND EFFLUENT DISPOSAL SYSTEMS

The various types of milking-sheds are listed in Table 36. The herringbone shed was the predominant type in the North Island, with the walk-through shed being the most common in the South Island. The age of the cowshed was based on the year of construction or year of latest renovation. The results were identical to the previous survey.

TABLE 36

Shed Types

Type of Cowshed	North Island	South Island	New Zealand
	(Percent of Farms)		
Herringbone (all types)	64	32	52
Walk-through	24	57	36
Rotary	10	6	8
All Others	2	5	4
Total	100	100	100
Age of Cowshed (years)	10	15	12
Pairs of Cupsets in use (No.)	11	8	10

TABLE 36a

Shed Types by Region and Quota Group

Type of Cowshed in Use	North Island			South Island		
	200-600 l	601-1000 l	1001 + l	200-600 l	601-1000 l	1001 + l
	(Percent of farms)			(Percent of farms)		
Herringbone (all types)	67	63	64	24	30	67
Walk-through	33	23	9	68	54	22
Rotary	0	9	27	0	13	11
All Others	0	6	0	8	3	0
Total	100	100	100	100	100	100
Age of Cowshed (years)	11	9	9	17	15	9
Pairs of Cupsets in use (no.)	8	11	15	7	9	12

Table 37 lists the distribution of types of effluent disposal systems. Compared with the previous year when 25 percent of farms used nearby streams and water courses for their shed effluent, in this current survey the figure has dropped to 22 percent.

TABLE 37

Distribution of Types of Effluent Disposal Systems

Effluent Disposal System	North Island	South Island	New Zealand
	(Percent of farms)		
Spray Irrigation	32	37	34
Use of Sumps	17	34	23
Pumping onto Pasture	16	9	13
Cartage from Shed	2	9	5
Settling Tanks	2	4	3
Into Streams etc.	31	7	22
Total	100	100	100

TABLE 37a

Distribution of Types of Effluent Disposal Systems
by Region and Quota Group

Effluent Disposal System	North Island			South Island		
	200-600 l	601-1001 l	1001 + l	200-600 l	601-1001 l	1001 + l
	(Percent of farms)			(Percent of farms)		
Spray Irrigation	20	34	46	27	43	56
Use of Sumps	17	20	9	41	27	22
Pumping onto Pasture	17	14	18	11	10	0
Cartage from Shed	3	3	0	11	3	22
Settling Tanks	0	0	9	3	7	0
Into Streams etc.	43	29	18	7	10	0
Total	100	100	100	100	100	100

APPENDIX G

SUPPLEMENTARY FEED USE

Details of the supplementary feed used during the 1976-77 season appear in Table 38. There were increased quantities of hay, silage, grain and meal used on the average survey farm. The area in forage crops however, was much less.

TABLE 38

Supplementary Feed Use 1976-77

Type of Feed	Units per Farm	North Island	South Island	New Zealand
Hay	bales	3,578	7,161	4,968
Silage	tonnes	348	149	271
Forage crop	ha	1.25	2.47	2.31
Grain	tonnes	2.5	27.3	12.1
Meal	tonnes	9.2	6.3	8.1
Farms Feeding Grain or Meal:				
Grain: Proportion farms (%)		6.8	49.0	23.2
Meal: Proportion farms (%)		50.3	30.8	42.7
Grain: tonnes/farm		26.4	54.5	37.3
Meal: tonnes/farm		18.2	18.4	18.3

TABLE 38a

Supplementary Feed Use 1976-77

by Region and Quota Group

Type of feed	Units/ farm	North Island 200-600 l	North Island 601-1000 l	North Island 1001 + l	South Island 200-600	South Island 601-1000 l	South Island 1001 + l
Hay	bales	2,499	3,349	5,866	4,542	8,229	13,538
Silage	tonnes	177	368	595	94	188	241
Forage crop	ha	1.30	1.13	1.43	4.08	4.29	2.73
Grain	tonnes	0	1.4	9.1	33.6	17.7	30.9
Meal	tonnes	5.1	8.4	17.7	3.5	5.1	19.8
Farms Feeding Grain or Meal:							
Grain Proportion farms (%)		0	11.4	9.0	54.1	40.0	55.6
Meal Proportion farms (%)		53.3	45.7	54.5	27.0	26.7	55.6
Grain tonnes/ farm		0	12.0	100.0	62.1	44.2	55.6
Meal tonnes/ farm		9.6	18.3	32.5	12.9	19.3	35.6

APPENDIX H

COMPARISON WITH SURVEY RESULTS OF PREVIOUS YEARS

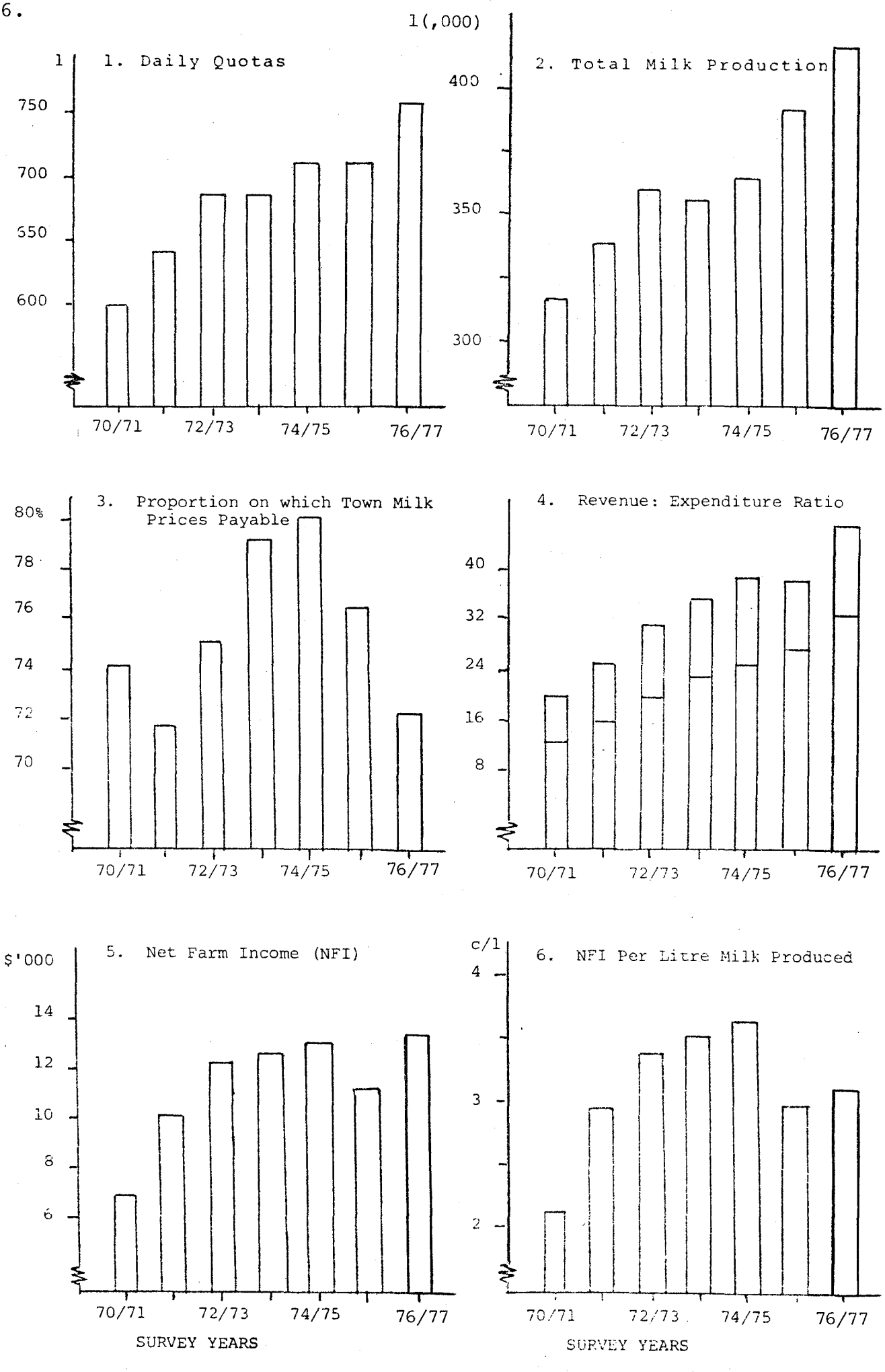
TABLE 39

Comparison with Survey Results of Previous Years

Characteristic	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
N.Z. Suppliers (No.)	1,817	1,782	1,743	1,693	1,709	1,732
Survey Sample (No.)	181	174	90	90	90	152
(a) Physical						
Productive Farm Area (ha)	66.0	74.9	73.0	73.2	77.7	81.8
Daily Quota (l)	641	682	682	728	726	766
Herd Size (No. Cows)	93	100	100	102	105	112
Milk Production (l/farm)	339,079	362,746	356,985	369,611	385,334	433,752
Milk Production (l/labour unit)	210,608	176,947	175,854	188,577	190,759	203,639
Milk Production (l/prod. ha)	5,138	4,842	4,890	5,053	4,959	5,304
Milk Production (l/dairy prod. ha)	N.A.	N.A.	N.A.	4,945	5,124	5,465
Total Labour Units Engaged (L.U.)	1.61	2.05	2.03	1.96	2.02	2.13
(b) Financial						
Total Assets ($/farm)	77,034	95,552	167,952	203,724	223,081	240,247
Gross Revenue ($/farm)	25,789	31,800	35,875	38,328	38,513	46,955
Gross Revenue (c/l)	7.607	8.77	10.050	10.370	9.995	10.825
Total Expenditure ($/farm)	15,723	19,564	23,351	24,696	27,170	33,462
Total Expenditure (c/l)	4.635	5.394	6.542	6.688	7.051	7.714
Net Income ($/farm)	10,066	12,236	12,524	13,632	11,343	13,493
Net Income (c/l)	2.972	3.377	3.508	3.682	2.944	3.110

Survey comparisons are given in the form of histograms in Figure 1. The data for these histograms are taken from the last seven national farm cost surveys.

FIGURE 1. SURVEY COMPARISONS



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