

# Dairy Cost Study

**The Economics of  
Milk Production  
in Alberta  
2011**



**Government  
of Alberta** ■

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**THE DAIRY COST STUDY:  
ECONOMICS OF MILK PRODUCTION  
IN ALBERTA  
2011**

**Volume 71**

by

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# Introduction

The Dairy Cost Study is a valuable benchmark of cost and return information for individual dairy producers in Alberta. Participants in the study receive a detailed analysis of their farming operation which can be directly compared to the provincial profiles (e.g. average, top-third, bottom-third). Other dairy producers in the province can compare their own records and analysis with the provincial profiles. The Dairy Cost Study also provides vital information to other dairy industry participants, such as financial institutions, market analysts and policy analysts.

The Dairy Cost Study was introduced during World War II. Since then, the Economics Branch has added cost and return assessments for a wide range of crop and livestock production in Alberta.

In summary, the objectives of the study are as follows:

- to provide an annual account of the costs and returns of fluid milk production in Alberta;
- to provide the participating dairy farmers with a personal business analysis for management purposes;
- to provide a benchmark for the evaluation of milk pricing; and
- to provide economic information for farm management, extension education, and service providers.

## The Dairy Cost Study

The Dairy Cost Study is an economic analysis of the costs and returns of a sample of Alberta dairy producers for a given production year. Study participants are required to complete monthly survey forms regarding their dairy production activities - dairy herd inventory, capital purchases, milk sales and farm use, feed use and purchase costs, labour costs, and other expenses related to the dairy enterprise - and an annual form on their dairy investments. (The survey forms are shown in Appendix E.) From this database, weighted sample averages are calculated which represent benchmarks for all dairy producers in the province. As well, study participants receive a confidential report on their dairy operation which can be compared with these provincial benchmarks.

As the analysis is based on monthly survey data collected from milk producers, the results indicate the cost of producing both fluid and industrial milk. However, the cost of producing only industrial milk should not be significantly different. In 2011, approximately 50 percent of Alberta's total milk production went into fluid milk, with the remainder going to industrial uses. Moreover, since 1988 the quality of fluid and industrial milk in Alberta has become indistinguishable. Effective August, 2008, Alberta moved to a total production quota system (TPQ) and no distinction is made between milk produced for fluid or industrial purposes at the farm level. Effective August, 2009, it became mandatory for Alberta milk producers to participate on the Canadian Quality Milk Program.

## The Survey Group

Fifty-two dairy producers across the province submitted monthly business information for the 2011 calendar year. Two regional sub-groups were also identified for Northern Alberta (north of Ponoka) and Southern Alberta. Northern Alberta was represented by 20 producers while Southern Alberta had 32 participants complete the study.

The study was designed to represent a cross section of dairy farms by the size of their milk quota. Efforts were made to select study participants by systematic random sampling to provide better representation of the total population. Some characteristics of the sample are shown in Table 1. Appendix D presents charts showing individual results for the 52 dairy cost study participants.

**Table 1**  
**2011 Sample Characteristics**

Years in Dairy	Total Sample	<u>Indebtedness</u>		<u>Herd Size (# of cows)</u>		
		%	<30%	≥30%	<75	≥75
<10	12		2	4	2	4
≥10	88		26	20	7	39
<b>Total (%)</b>	<b>100</b>		<b>54</b>	<b>46</b>	<b>17</b>	<b>83</b>

## Study Methodology

1. **Enterprise identification:** There are several different approaches for calculating the farm cost of producing fluid milk. Some studies use the total farm approach, which combines the dairy costs with those of other enterprises. This Alberta study examines only the dairy enterprise, which is defined as all activities associated with both milking cows and maintaining dry cows and young dairy stock. In most cases, the dairy operator uses home-grown feed in association with purchased feed. The costs of production of the homegrown feed are allocated to the crop enterprise portion of the farm, and are not considered in the dairy enterprise. Consequently, the final costs outlined in this report are only those associated with milk production.
  
2. **Inventory adjustment:** Since the cost of raising young dairy stock is included in the cost of milk production, the total income includes net cattle sales and net inventory changes. Cattle inventory changes, or herd growth, are determined by subtracting the beginning-year inventory value from the year-end inventory value. Gross income is thus composed of milk sales, net cattle sales, and the value of this net inventory adjustment. The net inventory adjustment may be negative or positive.
  
3. **Home grown feed:** Hay that is grown on the farm and fed to dairy livestock is priced at the regional market value of stacked hay on the farm. Similarly, feed grain is valued at regional



elevator prices provided by the Alberta Canola Producers Commission. In other words, the dairy enterprise is charged the current market value for these home-grown inputs, just as if they were purchased from the cropping enterprise. The total value of home-grown feed is determined by multiplying the regional value or price by the actual quantity fed. This procedure adequately compensates for the production cost of home-grown feed. Alternatively, where feed is purchased, the actual purchase cost is used in the analysis.

4. **Value of investment and depreciation:** The information presented in this report is intended to reflect the average yearly production conditions in the dairy industry. Depreciation estimates are based on the original value of buildings and machinery. Current market value of owned assets is also estimated by updating the original value of the dairy investment with appropriate inflation factors, and then depreciating each item accordingly, based on the number of years in use. Original values and years in use are obtained from participants' farm records. With the exception of acreage for pasture, house, dairy buildings and corral location, farmland is not considered to be a dairy investment. The dairy livestock inventory is valued using the average annual market price. Value of investment is used for calculating the return to equity, and for determining the equity position of the dairy operation.
  
5. **Operator and family labour:** The operator's actual labour may vary from almost none on some dairy farms to the total input of labour on other farms. The procedure used in this study to put a value to operator labour is to multiply the operator's labour hours times the average hourly wage rate paid for dairy labour reported by the participants on the study. (All type of paid labour is included in this category from strictly feeding, to all general chores, to relief milking.) Assigning a value to operator labour is preferred over leaving it as unpaid labour because of the great variability in labour time between operators. Family labour is evaluated similar to the above, but a lower wage rate is applied to family members under the age of 16. Partners, spouses and other family members (16 years of age or older) receive the same wage rate as the operator.
  
6. **Interest on capital:** The actual interest paid on existing liabilities is included in the capital cost. To obtain this value, participating producers were asked to report their outstanding liabilities (excluding quota) and the interest rates charged. This method is more accurate than

reporting the total annual interest paid. When both the total variable cost and the capital cost for the dairy enterprise are subtracted from gross income, the bottom line residual is the return to equity and management. When this residual is expressed as a percentage of the equity capital, then the percent return to equity can be compared with the returns from alternative investment opportunities such as Canada Savings Bonds or term deposits.

7. **Rent:** Rent charges are included in the cost of capital. The capital cost in this context represents the cost of ownership of resources. If resources are rented, there is a charge for their use. If, on the other hand, resources are owned, the owner must bear the cost of depreciation and interest on debt.

## Dairy Enterprise Economic Overview

Tables 2 through 4 provide a summary of the costs and returns for dairy producers in Alberta. (Definitions of terms listed in the tables are provided on page nine. More detailed results are presented in Appendices A, B, and C.) In Table 2, the average results for the entire survey sample are listed in the centre column. As well, costs and returns are provided for two sub-groups of dairy producers based on their total production costs, namely the bottom 1/3 and the top 1/3. The bottom 1/3 are the highest cost producers and the top 1/3 the lowest cost producers. The top 1/3 group's total costs were 28.5 percent or \$24.19/hL lower than the bottom 1/3. This gap has increased 2.5 percent from 2010, mostly influenced by feed costs and labour costs. Gross income, however, has only a slightly less than \$1.00 difference with the lower cost producers receiving the higher gross income, a switch from 2010 when the higher cost producers received the higher gross income.

Table 3 compares the average costs and returns for 2010 and 2011. In 2011, total cost of production increased 3.3 percent or \$2.23/hL compared to 2010. The largest increase between 2010 and 2011 was in feed costs, specifically in the complete feed category. This category includes all dairy rations and calf feed. The increase has come from the increase in prices for commodities included in the mixed rations. The price of roughage has decreased from 2010. Variable costs have remained constant and capital costs have dropped slightly mainly due to favourable interest rates.

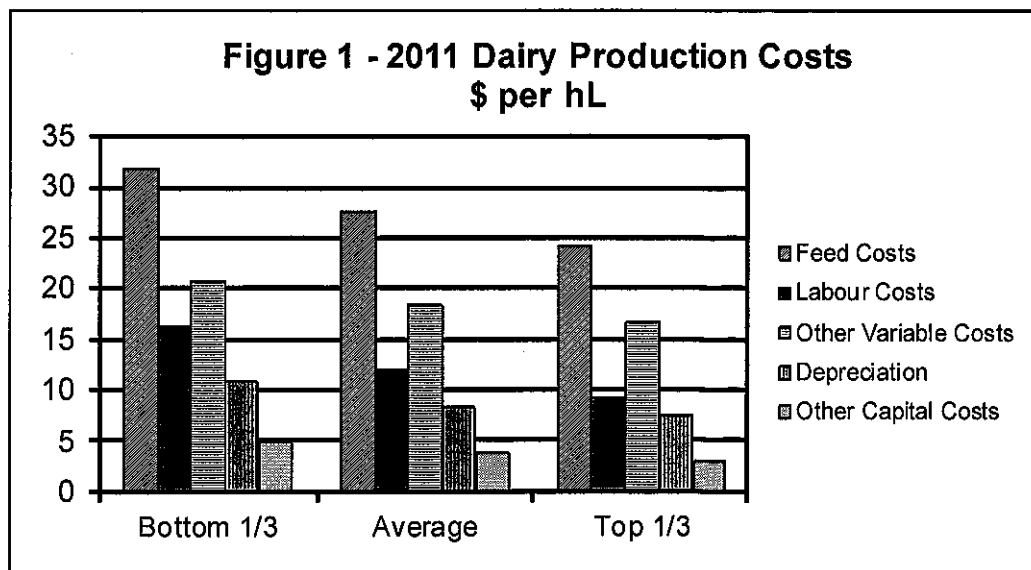
Finally, Table 4 compares average costs and returns for Northern and Southern Alberta.

**Table 2**

**Dairy Enterprise Costs and Returns - \$ Per hL Sold**

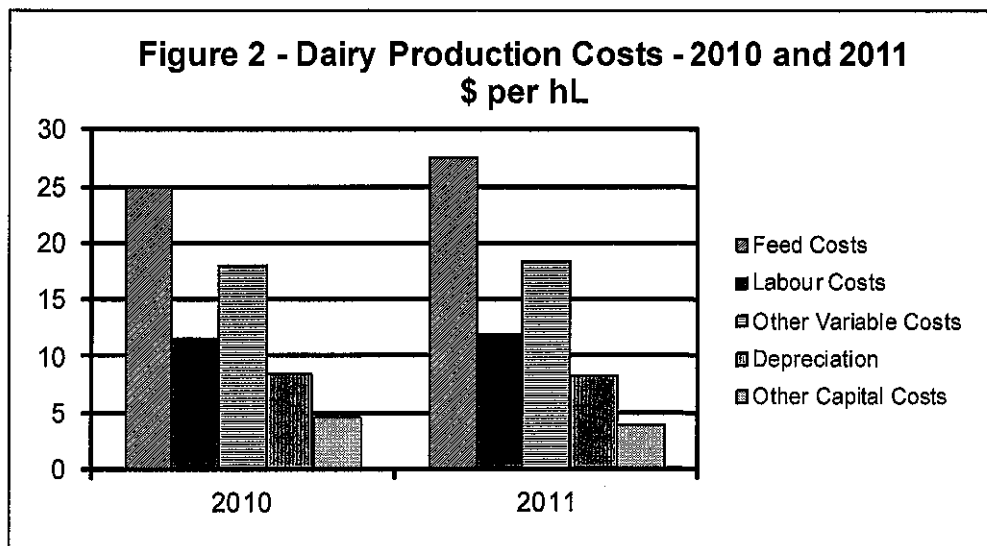
**Bottom 1/3 (Highest Cost Producers), Average Cost, Top 1/3 (Lowest Cost Producers)**

	Bottom 1/3	Average	Top 1/3
Milk Sales	80.26	79.15	78.73
<b>Gross Income</b>	<b>83.45</b>	<b>84.02</b>	<b>84.36</b>
Feed Cost	31.89	27.54	24.24
Main Feed Components:			
Grain	2.21	3.75	3.73
Complete Feed	15.98	11.87	9.75
Roughage	9.40	8.09	7.15
Labour Costs	16.36	11.89	9.15
Other Variable Costs	20.72	18.37	16.80
Depreciation	10.86	8.30	7.39
Other Capital Costs	4.92	3.90	2.96
<b>Total Production Costs</b>	<b>84.75</b>	<b>70.00</b>	<b>60.56</b>
<hr/>			
Total Cash Costs	59.40	53.18	46.45
<hr/>			
<b>Gross Margin</b>	<b>24.05</b>	<b>30.84</b>	<b>37.91</b>
<b>Contribution Margin</b>	<b>14.48</b>	<b>26.22</b>	<b>34.17</b>
<b>Return to Investment</b>	<b>1.67</b>	<b>16.26</b>	<b>25.38</b>
<b>Return to Equity</b>	<b>-1.31</b>	<b>14.02</b>	<b>23.81</b>
<hr/>			
Return to Investment (%)	1.4	11.1	20.6
Return to Equity (%)	0.6	14.2	27.3



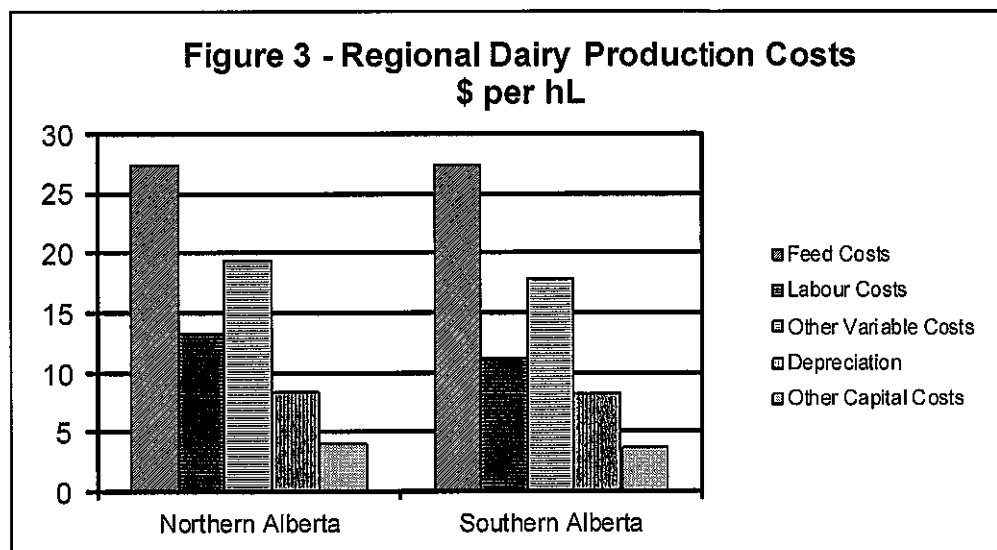
**Table 3**  
**Dairy Enterprise Costs and Returns - \$ Per hL Sold**  
**2010 and 2011**

	2010 (51 producers)	2011 (52 producers)
Milk Sales	76.46	79.15
<b>Gross Income</b>	<b>80.57</b>	<b>84.02</b>
Feed Costs	25.03	27.54
Main Feed Components:		
Grain	3.06	3.75
Complete Feed	8.27	11.87
Roughage	9.75	8.09
Labour Costs	11.56	11.89
Other Variable Costs	18.06	18.37
Depreciation	8.53	8.30
Other Capital Costs	4.60	3.90
<b>Total Production Costs</b>	<b>67.77</b>	<b>70.00</b>
<b>Total Cash Costs</b>	<b>51.47</b>	<b>53.18</b>
<b>Gross Margin</b>	<b>29.10</b>	<b>30.84</b>
<b>Contribution Margin</b>	<b>25.93</b>	<b>26.22</b>
<b>Return to Investment</b>	<b>15.36</b>	<b>16.26</b>
<b>Return to Equity</b>	<b>12.80</b>	<b>14.02</b>
<b>Return to Investment (%)</b>	<b>10.5</b>	<b>11.0</b>
<b>Return to Equity (%)</b>	<b>14.0</b>	<b>14.2</b>



**Table 4**  
**Average Dairy Enterprise Costs and Returns - \$ Per hL Sold**  
**Northern and Southern Alberta**

	Northern Alberta (20 Producers)	Southern Alberta (32 Producers)
Milk Sales	78.30	79.55
<b>Gross Income</b>	<b>83.46</b>	<b>84.28</b>
Feed Costs	27.55	27.54
Main Feed Components:		
Grain	3.73	3.76
Complete Feed	10.34	12.59
Roughage	9.34	7.50
Labour Cost	13.30	11.22
Other Variable Costs	19.46	17.85
Depreciation	8.34	8.28
Other Capital Costs	4.14	3.79
<b>Total Production Costs</b>	<b>72.79</b>	<b>68.68</b>
<b>Total Cash Costs</b>	<b>55.19</b>	<b>52.23</b>
<b>Gross Margin</b>	<b>28.28</b>	<b>32.05</b>
<b>Contribution Margin</b>	<b>23.15</b>	<b>27.67</b>
<b>Return to Investment</b>	<b>12.70</b>	<b>17.95</b>
<b>Return to Equity</b>	<b>10.67</b>	<b>15.60</b>
<b>Return to Investment (%)</b>	<b>8.8</b>	<b>12.2</b>
<b>Return to Equity (%)</b>	<b>11.2</b>	<b>15.6</b>



## Definitions for the Dairy Cost Study

Net Cattle Sales - revenues associated with the purchase and sale of dairy livestock (milking / dry cows, replacement heifers, bulls and young stock).

Gross Income - the value of what was produced by the dairy enterprise over the course of the production year. Includes cash and non-cash values of:

- ◆ milk sales,
- ◆ revenues from miscellaneous sources (eg. colostrum sales, BSE test cow payments) Effective 2008, this now includes income for environmental compliance and a milk quality bonus (if applicable),
- ◆ inventory adjustments relating changes in the number & value of stock included in the enterprise, and
- ◆ net cattle sales.

Feed Costs - the cost of all feed used by the dairy enterprise, purchased or homegrown. (Homegrown feed is valued on the market value of the feed, **not** the cost of growing the feed).

Complete Feed - includes all feed values given under dairy ration, calf feed and milk replacer.

Labour Costs - a sum of paid and contributed labour, as allocated to the dairy enterprise. Paid labour is valued at cost, while unpaid labour is valued at a standard or base cost.

Other Variable Costs - total variable costs (such as bedding and supplies, vet and medicine, utilities, fuel, repairs) less feed and labour costs.

Depreciation - sum of depreciation and machinery/equipment/building lease payments on assets allocated to the dairy enterprise.

Other Capital Costs - total cash overheads, as allocated to the dairy enterprise (rent, property taxes, insurances, licences and term loan interest).

Total Cash Costs - total production costs less depreciation and family labour.

Total Production Costs - sum of all variable and capital production costs.

Contribution Margin - gross income less variable costs.

Gross Margin - gross income less total cash costs.

Return to Equity (\$) - gross income less total production costs.

Investment - sum of assets allocated to the enterprise. Includes: dairy livestock, machinery, equipment, buildings/facilities and building site.

Return to Investment (\$) - gross income less total production costs plus capital interest.

Median - the value of the middle item of a data set that has been arranged in an increasing order (lowest to highest).

Total Production Quota (TPQ) - single quota system (effective August, 2008)

## Production Factor Analysis

This section provides a detailed analysis of the survey group based on six specific production factors:

- herd size
- milk production
- gross income
- total cost
- investment
- labour

For each analysis, the survey group is sorted into three separate classes (bottom 1/3, middle 1/3, top 1/3) based on the production factor being evaluated. For instance, on the next page the survey group has been divided into three sub-groups based on herd size. The bottom 1/3 group consists of the smallest dairy enterprises while the top 1/3 group consists of the largest producers. Production and management results are shown for each sub-group in the accompanying table and figures.

## Dairy Characteristics by Herd Size Class

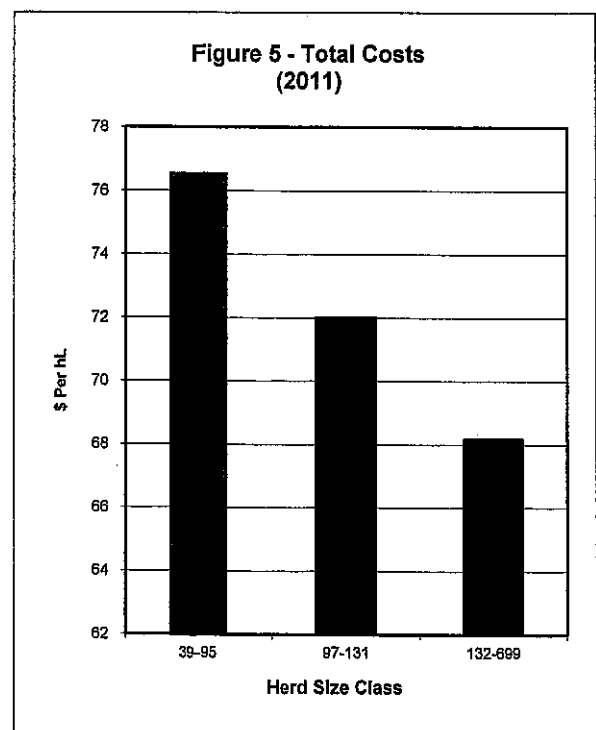
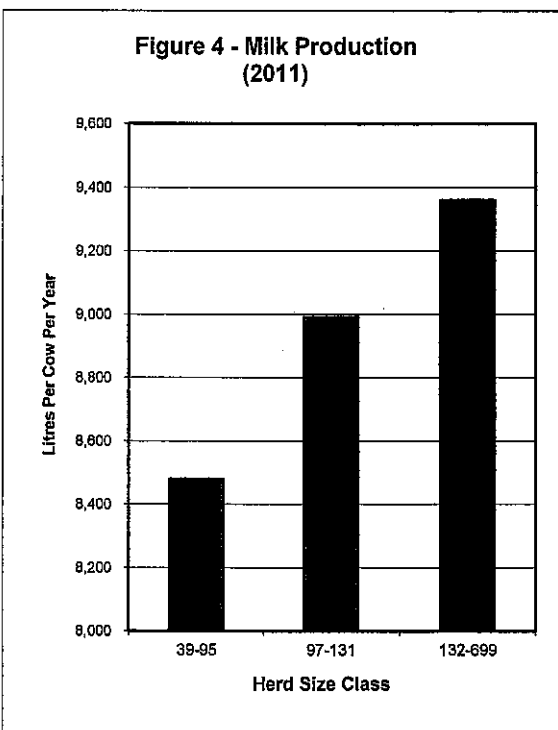
**Table 5 - Dairy Enterprise Characteristics by Herd Size Class**

Herd Sizes ranged from 39 to 699 milking cows. For this analysis, the sample group was split into the following three size classes:

Bottom 1/3      39 - 95  
 Middle 1/3     97 - 131  
 Top 1/3        132 - 699

	Bottom 1/3 39-95	Middle 1/3 97-131	Top 1/3 132-699
Years in Dairy	18.71	23.00	23.50
<b>Milk Production (litres/yr)</b>	<b>8,479.52</b>	<b>8,991.62</b>	<b>9,359.73</b>
Home Grown Feed (%)	81.5	69.1	71.4
Butterfat Test (kg/hL)	3.94	3.90	3.86
Gross Income (\$/hL)	83.67	84.20	84.19
<b>Total Costs (\$/hL)</b>	<b>76.53</b>	<b>72.01</b>	<b>68.17</b>
Feed Costs (\$/hL)	26.71	27.97	27.67
Labour (hrs/cow)	64.33	55.57	47.92
Investment (\$/cow)	12,838.34	13,587.23	12,756.82
Return to Equity (%)	10.9	11.0	20.6
Return to Investment (%)	7.7	9.2	12.7
Debt/Capital Ratio	0.25	0.22	0.35

Figures 4 and 5 illustrate Milk Production and Total Costs results for the bottom, middle and top 1/3 groups (sorted by Herd Size Class).





## Dairy Characteristics by Milk Production Class

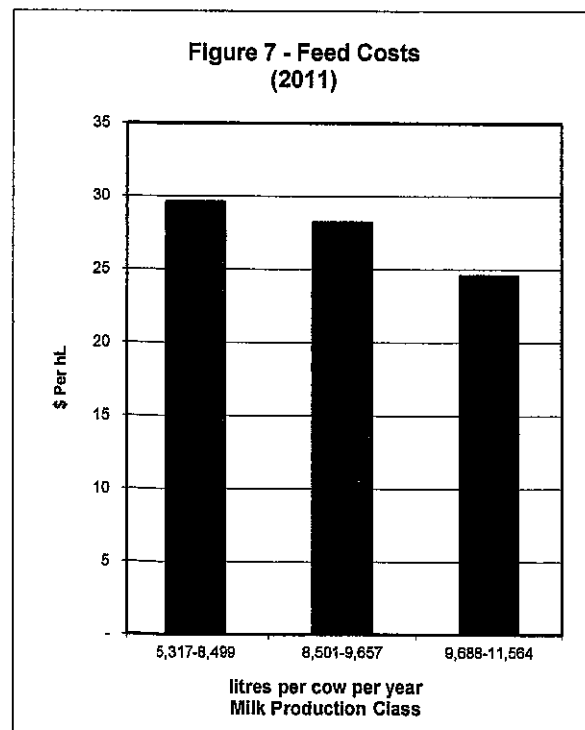
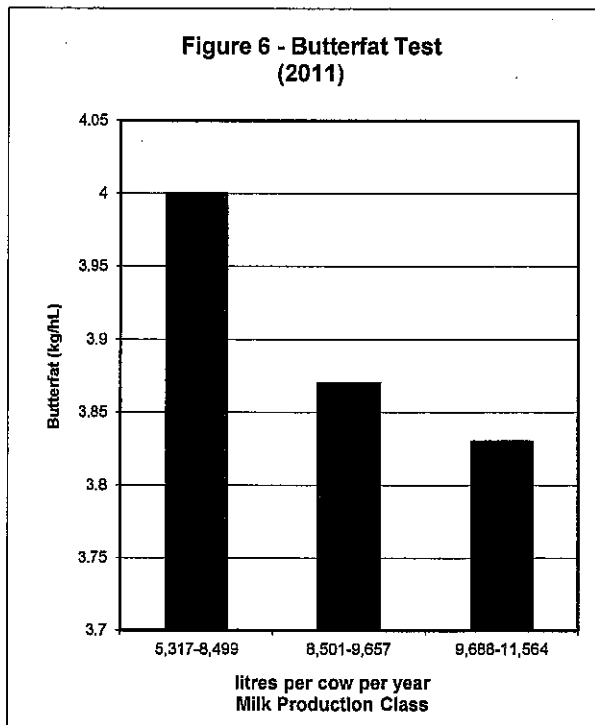
**Table 6 - Dairy Enterprise by Milk Production Class**

Milk Production ranged between 5,317 and 11,564 litres per cow per year. For this analysis, the sample group was split into the following three classes:

Bottom 1/3    5,317 - 8,499  
 Middle 1/3    8,501 - 9,657  
 Top 1/3       9,688 - 11,564

	Bottom 1/3 5,317-8,499	Middle 1/3 8,501-9,657	Top 1/3 9,688-11,564
Years in Dairy	21.32	23.64	20.21
Herd Size	147.29	112.08	141.39
Home Grown Feed (%)	76.5	62.2	83.8
<b>Butterfat Test (kg/hL)</b>	<b>4.00</b>	<b>3.87</b>	<b>3.83</b>
Gross Income (\$/hL)	83.83	84.31	83.91
Total Costs (\$/hL)	79.94	71.70	65.08
<b>Feed Costs (\$/hL)</b>	<b>29.60</b>	<b>28.18</b>	<b>24.56</b>
Labour (hrs/cow)	57.19	56.47	54.11
Investment (\$/cow)	12,401.71	13,114.48	13,694.00
Return to Equity (%)	7.5	11.0	24.0
Return to Investment (%)	3.8	9.5	16.3
Debt/Capital Ratio	0.29	0.20	0.32

Figures 6 and 7 illustrate Butterfat Test and Feed Costs results for the bottom, middle and top 1/3 groups (sorted by Milk Production Class).



## Dairy Characteristics by Gross Income Class

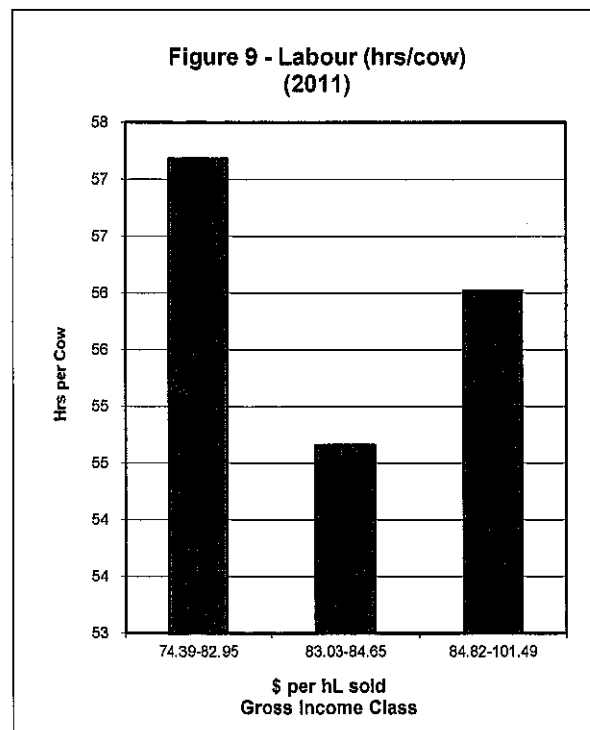
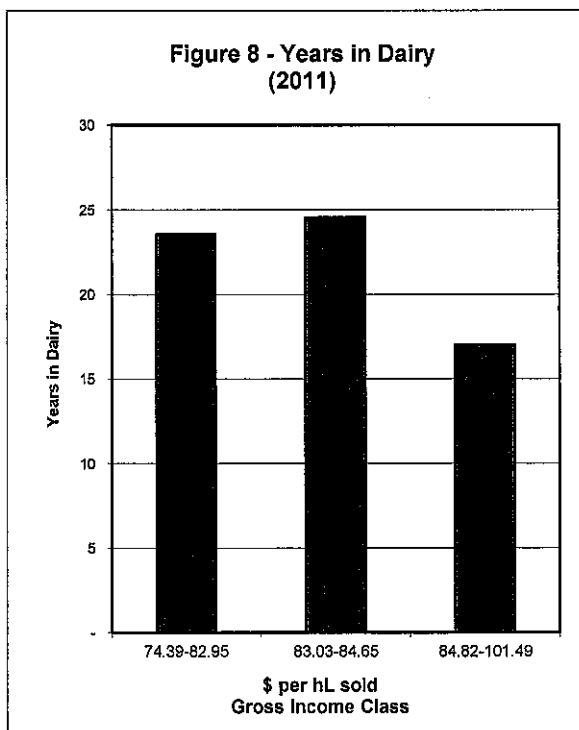
**Table 7 - Dairy Enterprise by Gross Income Class**

Gross Income ranged between \$74.39 and \$101.49 per hL sold. For this analysis, the sample group was split into the following three classes:

Bottom 1/3      74.39 - 82.95  
 Middle 1/3      83.03 - 84.65  
 Top 1/3          84.82 - 101.49

	Bottom 1/3 74.39-82.95	Middle 1/3 83.03-84.65	Top 1/3 84.82-101.49
<b>Years in Dairy</b>	<b>23.56</b>	<b>24.56</b>	<b>17.00</b>
Herd Size	139.16	127.04	133.69
Milk Production (litres/yr)	8,837.28	9,042.38	8,948.23
Home Grown Feed (%)	74.0	65.5	82.8
Butterfat Test (kg/hL)	3.84	3.90	3.96
Total Costs (\$/hL)	72.35	74.55	69.65
Feed Costs(\$/hL)	27.94	28.10	26.31
<b>Labour (hrs/cow)</b>	<b>57.18</b>	<b>54.66</b>	<b>56.02</b>
Investment (\$/cow)	12,904.29	13,749.18	12,519.41
Return to Equity (%)	9.1	9.4	24.1
Return to Investment (%)	7.5	7.4	14.9
Debt/Capital Ratio	0.14	0.36	0.32

Figures 8 and 9 illustrate Years in Dairy and Labour results for the bottom, middle and top 1/3 groups (sorted by Gross Income Class).



## Dairy Characteristics by Total Cost Class

**Table 8 - Dairy Enterprise by Total Cost Class**

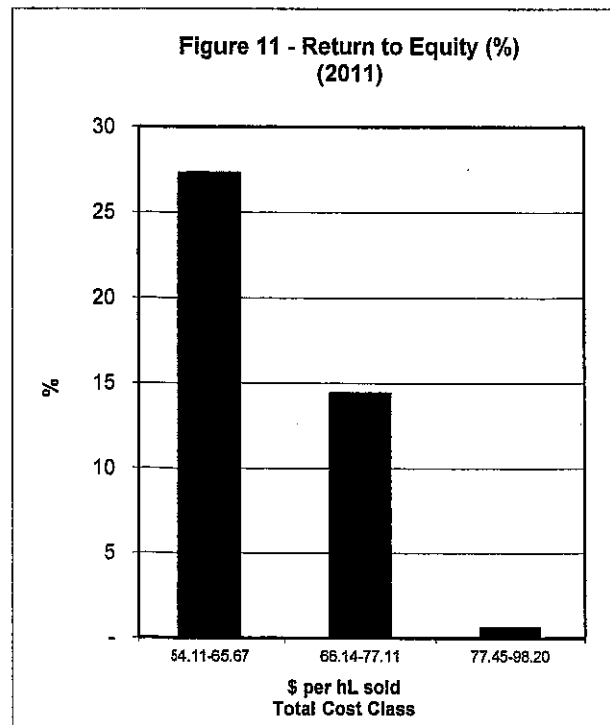
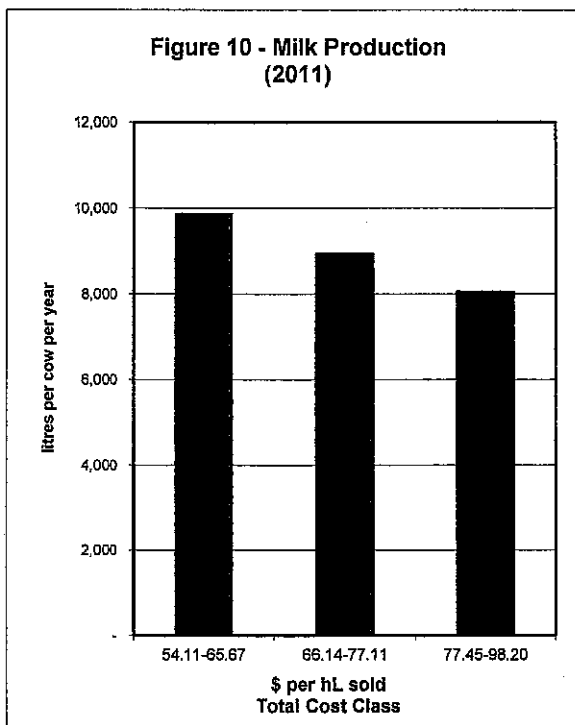
Total Cost ranged between \$54.11 and \$98.20 per hL sold. For this analysis, the sample group was split into the following three classes:

Top 1/3            54.11 - 65.67  
 Middle 1/3        66.14 - 77.11  
 Bottom 1/3        77.45 - 98.20

In this situation the top 1/3 are the lower cost producers and the bottom 1/3 are the higher cost producers.

	Top 1/3 54.11-65.67	Middle 1/3 66.14-77.11	Bottom 1/3 77.45-98.20
Years in Dairy	21.85	23.22	20.12
Herd Size	150.46	141.40	107.18
<b>Milk Production (litres/yr)</b>	<b>9,860.87</b>	<b>8,929.78</b>	<b>8,043.86</b>
Home Grown Feed (%)	87.4	67.0	67.7
Butterfat Test (kg/hL)	3.86	3.90	3.94
Gross Income (\$/hL)	84.36	84.25	83.45
Feed Costs (\$/hL)	24.24	26.32	31.89
Labour (hrs/cow)	43.04	61.58	62.84
Investment (\$/cow)	12,447.97	11,795.13	15,044.72
<b>Return to Equity (%)</b>	<b>27.3</b>	<b>14.4</b>	<b>0.6</b>
Return to Investment (%)	19.4	10.5	(0.3)
Debt/Capital Ratio	0.25	0.22	0.35

Figures 10 and 11 illustrate Milk Production and Return to Equity results for the top, middle and bottom 1/3 groups (sorted by Total Cost Class).



## Dairy Characteristics by Investment Class

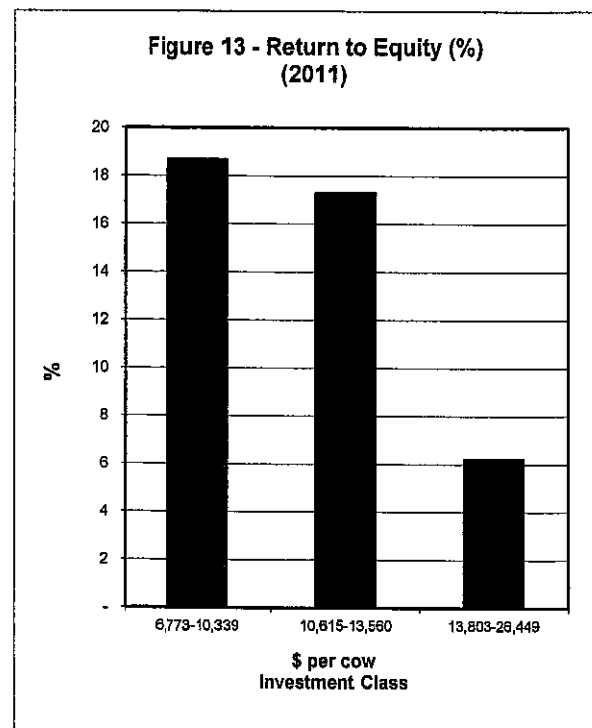
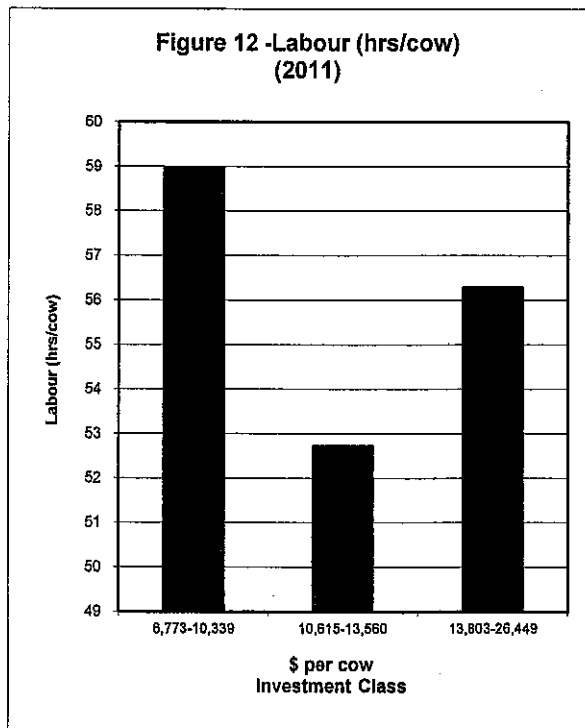
**Table 9 - Dairy Enterprise by Investment Class**

Investment per cow ranged between \$6,773 and \$26,449. For this analysis, the sample group was split into the following three classes:

Bottom 1/3    6,773 - 10,339  
 Middle 1/3    10,615 - 13,560  
 Top 1/3        13,803 - 26,449

	Bottom 1/3 6,773-10,339	Middle 1/3 10,615-13,560	Top 1/3 13,803-26,449
Years in Dairy	22.47	21.36	21.47
Herd Size	145.44	147.24	106.02
Milk Production (litres/yr)	8,539.22	9,174.92	9,105.95
Home Grown Feed (%)	70.3	75.9	75.4
Butterfat Test (kg/hL)	3.95	3.88	3.97
Gross Income (\$/hL)	83.91	84.79	83.32
Total Costs (\$/hL)	69.96	70.12	76.74
Feed Costs (\$/hL)	27.99	27.39	27.00
<b>Labour (hrs/cow)</b>	<b>58.98</b>	<b>52.72</b>	<b>56.28</b>
<b>Return to Equity (%)</b>	<b>18.7</b>	<b>17.3</b>	<b>6.2</b>
Return to Investment (%)	13.9	11.4	4.1
Debt/Capital Ratio	0.17	0.35	0.30

Figures 12 and 13 illustrate Labour and Return to Equity results for the bottom, middle and top 1/3 groups (sorted by Investment Class).



## Dairy Characteristics by Labour (hrs/cow) Class

**Table 10 - Dairy Enterprise by Labour (hrs/cow) Class**

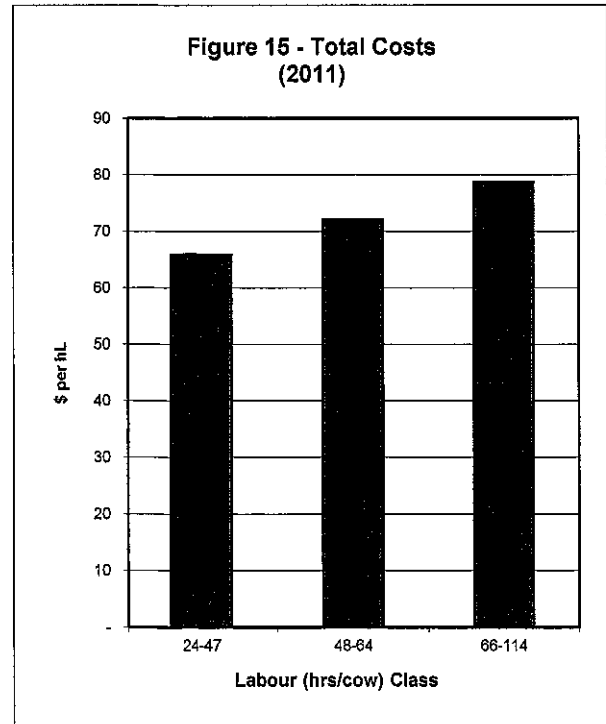
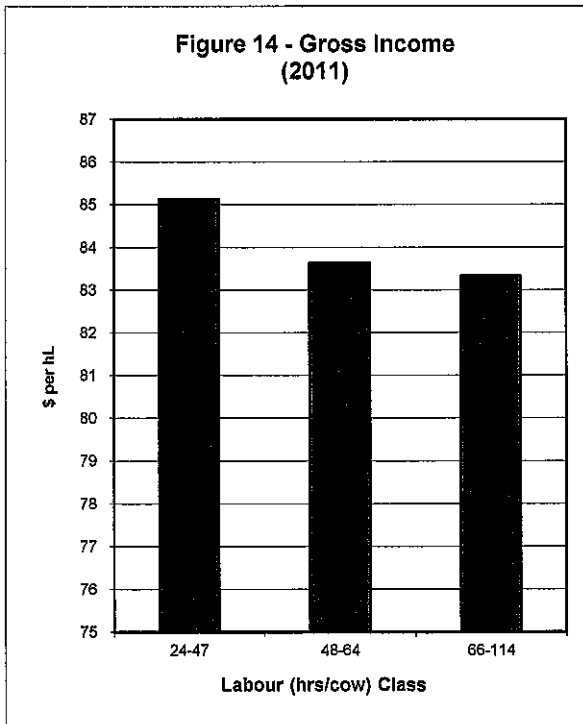
Labour (hrs/cow) ranged between 24 and 114.

For this analysis, the sample group was split into the following three classes:

Bottom 1/3      24- 47  
 Middle 1/3     48 - 64  
 Top 1/3        66 - 114

	Bottom 1/3 24-47	Middle 1/3 48-64	Top 1/3 66-114
Years in Dairy	23.00	20.22	22.15
Herd Size	192.41	111.33	97.07
Milk Production (litres/yr)	8,943.47	9,077.49	8,804.96
Home Grown Feed (%)	79.8	67.4	74.9
Butterfat Test (kg/hL)	3.94	3.91	3.85
<b>Gross Income (\$/hL)</b>	<b>85.13</b>	<b>83.64</b>	<b>83.32</b>
<b>Total Costs (\$/hL)</b>	<b>65.83</b>	<b>72.16</b>	<b>78.71</b>
Feed Costs (\$/hL)	25.96	28.39	27.98
Investment (\$/cow)	13,049.35	12,651.64	13,536.44
Return to Equity (%)	21.6	15.7	4.9
Return to Investment (%)	13.5	11.1	4.9
Debt/Capital Ratio	0.33	0.28	0.20

Figures 14 and 15 illustrate Gross Income and Total Costs results for the bottom, middle and top 1/3 groups (sorted by Labour hrs/cow Class).



## Detailed Management Factors, Northern and Southern Alberta

Table 11 provides a further examination of regional differences from a management perspective.

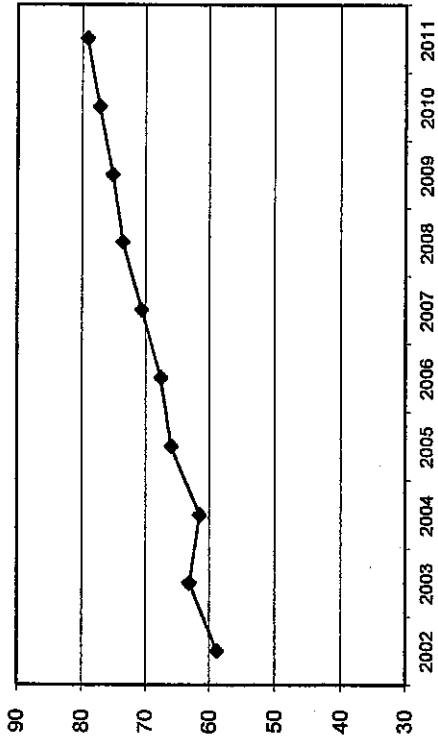
**Table 11**

### **Detailed Management Factors, Northern and Southern Alberta, 2011**

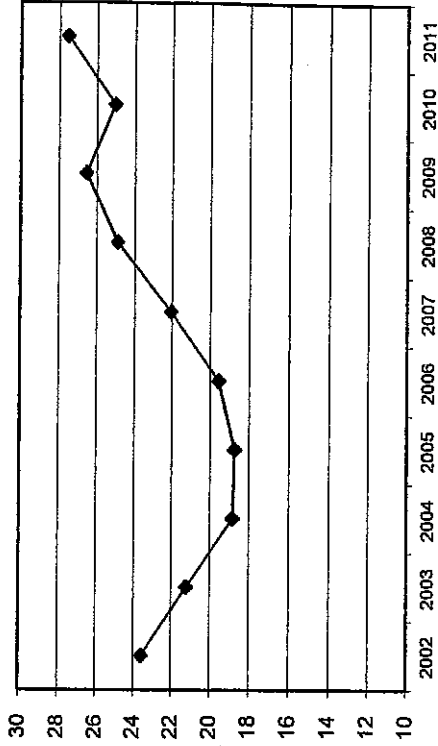
	<b>Northern Alberta</b>	<b>Southern Alberta</b>
Herd Size	116	144
Milk Production (litres/cow/year)	8,564.34	9,166.72
Feed Conversion (litres/kg concentrates)	2.10	2.06
Labour Productivity (litres/hr)	159.24	185.95
Labour Hours/Cow(hrs)	53.78	49.30
Investment/Cow (\$/cow)	11,974.15	13,109.83
Milk Production/\$ Invest (litres/\$)	0.72	0.70
Feed Costs (\$/cow)	2,291.33	2,449.79
Purchased Barley (\$/tonne)	186.18	193.36
Cost of Purchased Hay (\$/tonne)	126.90	139.73
Home Grown Roughage (%)	51.1	77.5
Butterfat Test (kg/hL)	3.93	3.88
Protein (kg/hL)	3.29	3.28
LOS (kg/hL)	5.67	5.65
Total Costs (\$/hL)	72.79	68.68
Contribution Margin (\$/hL)	23.15	27.67
Return to Investment (%)	8.8	12.2
Return to Equity (\$/hL)	10.67	15.60
Return to Equity (%)	11.2	15.6
Debt to Asset Ratio	0.33	0.32

# Historical Economic Trends

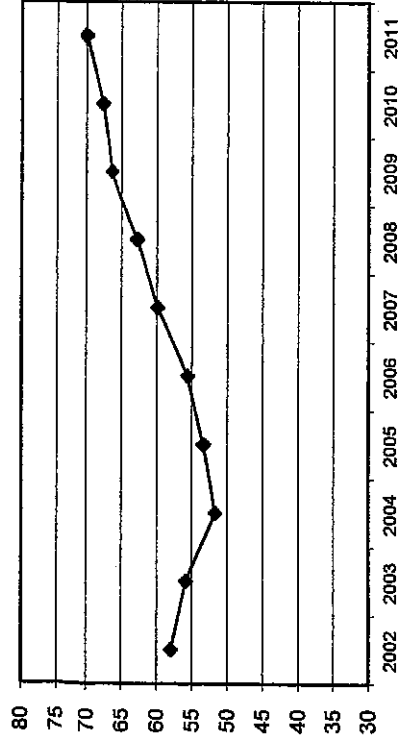
**Figure 16 - Average Milk Price (\$ per hL)**



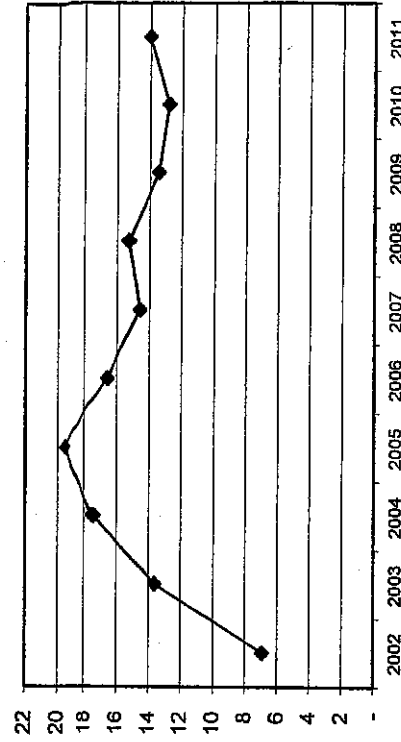
**Figure 17 - Feed Cost (\$ per hL)**



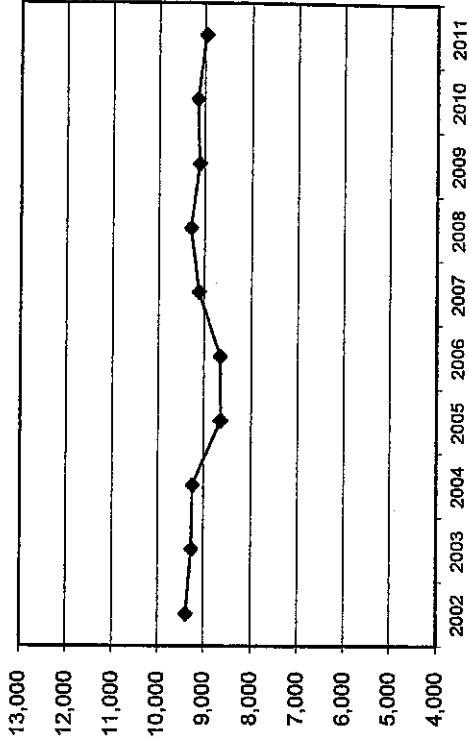
**Figure 18 - Total Cost (\$ per hL)**



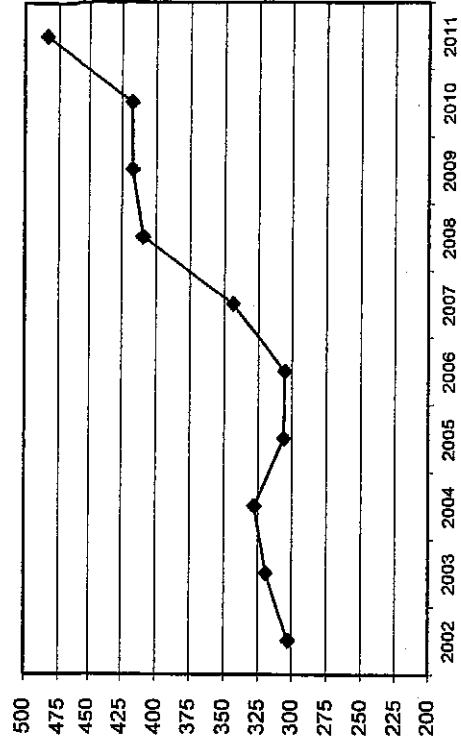
**Figure 19 - Return to Equity (%)**



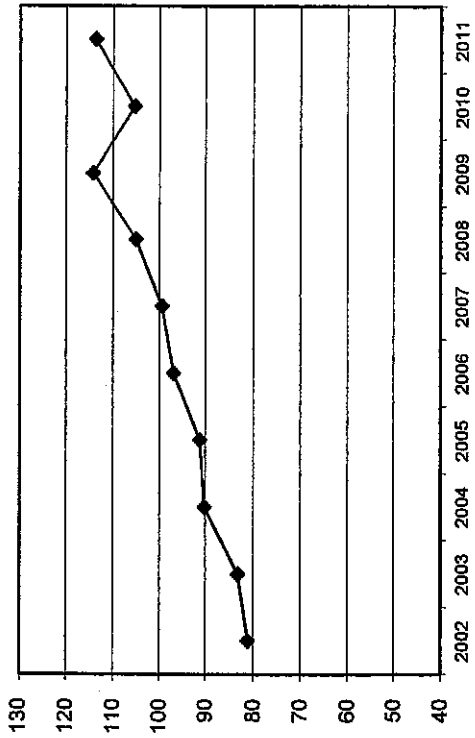
**Figure 21 - Milk Production  
(litres/cow per year)**



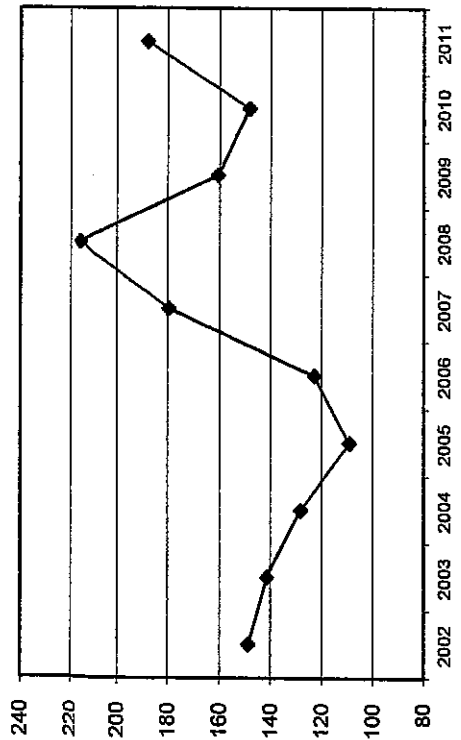
**Figure 23 - Cost of Dairy Ration  
(\$ per tonne)**



**Figure 20 - Median Size of Dairy Herd**



**Figure 22 - Purchased Barley Cost  
(\$ per tonne)**

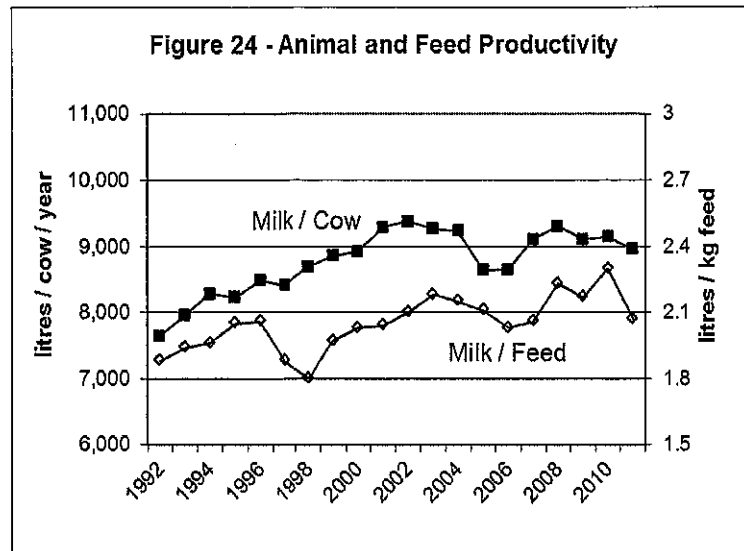




## Milk Productivity Factors

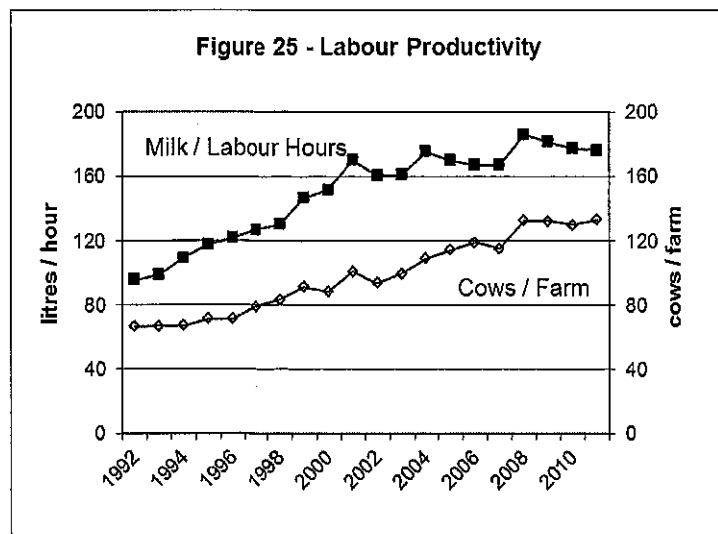
A number of management factors related to milk production are reported in Table 3 of Appendix A. They relate the amount of milk produced to three management inputs: feed, labour and capital. While these results reflect the participants in the study group, which changes over time, they are a fair representation of provincial averages.

Figure 24 shows that milk productivity per cow increased steadily from 1992 to 2001, with a total gain of 22 percent. After levelling off for four years, productivity dipped in 2005, rebounding in 2007. Many factors can affect milk productivity, including poor feed quality, housing changes, temperature/weather fluctuations, and cow stress. A decrease in quota allotment or adjusting to the daily quota system could also lead to management decisions to lower production for a period of time.

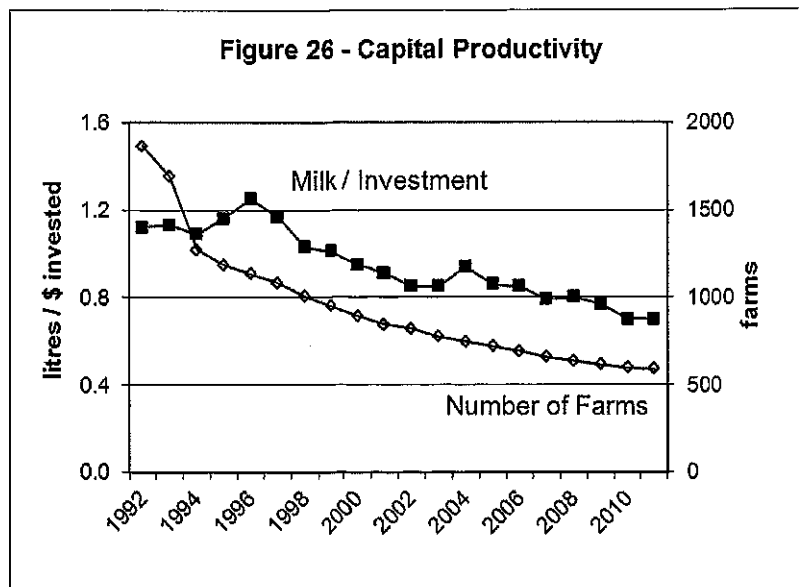


The feed conversion rates (or productivity) generally improved over the 18-year period, resulting in slightly higher milk production per unit of feed. However, there have been several dips in the feed conversion rates (1998, 2006 and 2011).

Figure 25 shows the amount of milk produced for each hour of labour on dairy farms. Labour productivity increased dramatically from 1993 to 2001. The figure also shows how the scale of dairy farms has increased. As farm size increased, each employee has been able to manage a larger number of dairy cows.



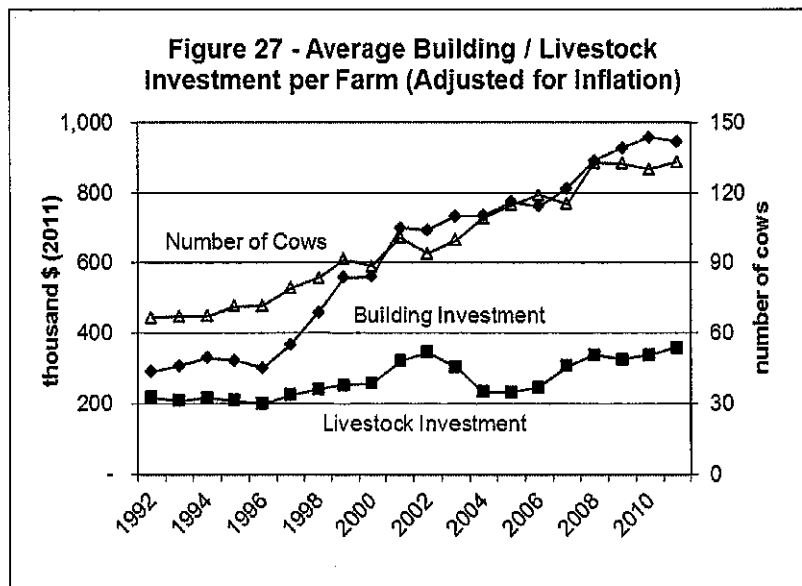
Labour intensity has gradually been traded for capital intensity (Figure 26). While labour productivity increased through 2001, capital productivity declined. Dairy producers were investing in more capital equipment, which allowed them to handle greater herd sizes per employee.



## Capital Investment Trends

### Per Farm

Trends in capital intensity are shown more directly in Figures 27 and 28. The average value of dairy buildings (adjusted for inflation) was very stable in the early years. Then, between 1996 and 2001, total investment climbed dramatically, increasing by 132 percent.

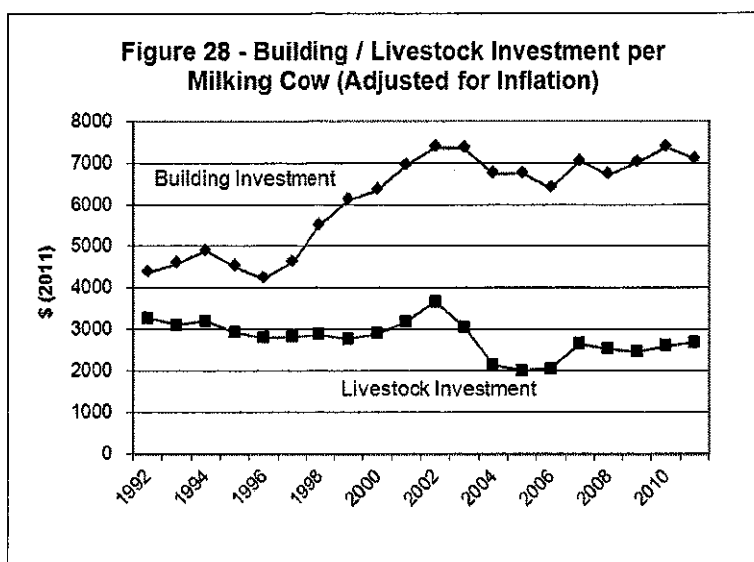


During this time, there was an increase in construction of new facilities, either by those already in Alberta or by those moving to the province from abroad. This was also the time of the first installation of robotic milkers on Alberta farms. This period coincided with a slightly higher rate in the expansion of herd sizes. After 2001, the average value of dairy buildings rose more slowly, in line with continued growth in the average herd size. Total building values rose again from 2007, partly due to a significant jump in the Dairy Cost Study average herd size in 2008.

The total value of livestock per farm (adjusted for inflation) was flat during the mid 1990s. Livestock inventory values grew significantly through 2002. However, they dropped by one-third in the wake of the BSE crisis despite an increase in cows per farm. They rebounded in 2007 and 2008.

### Per Milking Cow

Figure 28 shows average building and livestock investments per milking cow. It clearly shows how average building values per cow increased dramatically in the middle years, while remaining relatively flat in the early and later years.



Between 1992 and 2001, livestock values (adjusted for inflation) were generally flat. They gained in value briefly in 2002. However, after the appearance of BSE in 2003, livestock values, especially for cull cows and replacement heifers, dropped dramatically. Livestock values increased in 2007 but continue to be slightly lower than the previous decade.

## Dairy Enterprise Investment and Debt Levels

Total dairy farm investment (excluding quota) remained relatively stable at \$1,695,227 per farm in 2011, compared to an average of \$1,686,600 in 2010. On a per cow basis, this works out to \$12,729 (Table 12). Of this total amount, 73 percent was comprised of buildings and equipment investment, 21 percent referred to livestock investment, the remaining 6 percent being invested in land and supplies. In 2011, there was an increase in the number of acres of pasture used for grazing the dairy cattle. This is partially due to the increased participation of producers in the southern part of Alberta where grazing is slightly more prominent and land more available.

**Table 12**  
**Annual Investment and Debt on Dairy Farms**

	2009	2010	2011
	- - - \$ Per Cow - - -		
Land	421	449	589
Buildings and Equipment	8,704	9,719	9,331
Livestock	2,625	2,700	2,694
Supplies	116	119	115
<b>TOTAL</b>	<b>11,866</b>	<b>12,987</b>	<b>12,729</b>
Debt	4,588	4,863	4,128
Equity	7,278	8,124	8,601
<b>TOTAL</b>	<b>11,866</b>	<b>12,987</b>	<b>12,729</b>

The debt/capital ratio measures the extent of external financing on dairy farms in Alberta. This ratio was 32 percent in 2011, a 5 percent decrease from 2010. Although the percentage of debt has dropped quite considerably, total investment has remained stable, dropping only \$200 per cow from 2010.

## Debt Repayment Capacity

The acceptable debt load or repayment capacity of a dairy enterprise can be measured by the contribution margin. Contribution margin is the difference between gross income and variable costs. Therefore, it represents the amount of money available to pay for capital assets - rent, mortgage payments (principle and interest), and taxes. The amount of cash remaining after capital assets payments is the producer's return to owner equity, or profit. A summary of contribution margins for the dairy years 2009, 2010, and 2011 is presented in Table 13.

**Table 13**  
**Summary of Average Costs and Returns in Alberta**  
**2009 - 2011**

	2009	2010	2011	2009-2011
	----- \$ Per Cow -----			
<b>A. Gross Income</b>	6825	7141	7310	7092
<b>B. Feed Costs</b>	2336	2218	2397	2317
<b>C. Variable Costs</b>	2444	2624	2632	2567
 <b>Contribution Margin</b>	 2044	 2298	 2281	 2208
<b>(A - B - C)</b>				

The contribution margin can be used to determine the amount of debt load that a farm enterprise can carry. Table 14 shows the total debt load that a farm enterprise can carry on a per cow basis at various interest rates and various cow productivity levels. It is based on the average costs and returns between 2009 and 2011. The assumptions behind the analysis are that feed costs vary directly with the level of production and market values. Operating costs such as labour, maintenance, and repairs have increased slightly over the past 2 years, however, the 3 year average remains relatively unchanged at \$2,567 per cow.

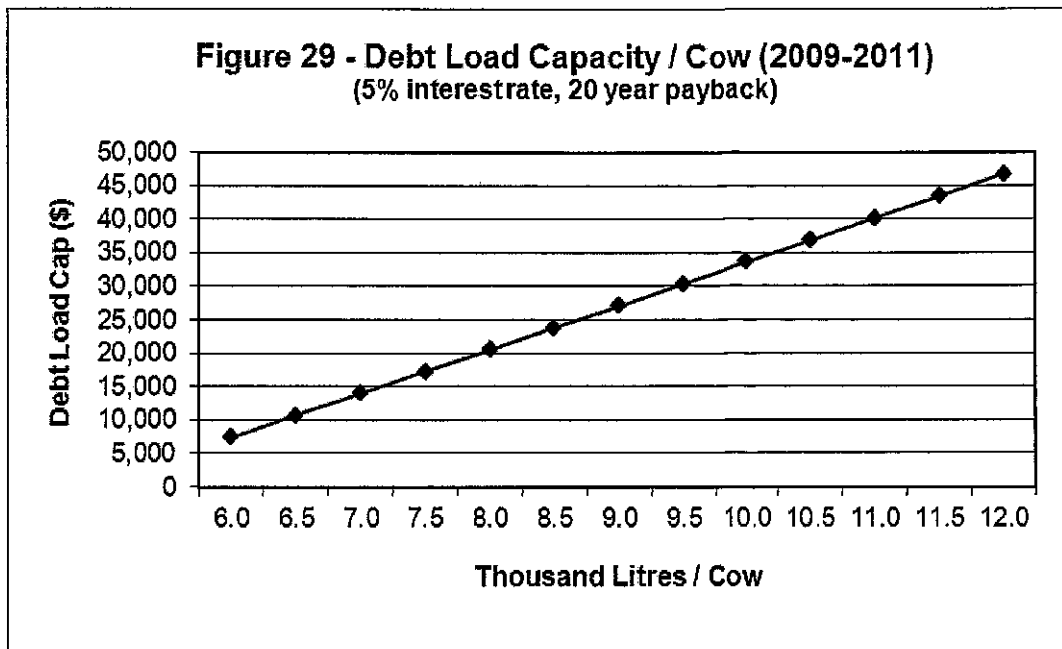
**Table 14**  
**Acceptable Total Debt-Load per Cow in Alberta, 2009-2011\***

Milk Productivity (litres/cow)	Interest Rates					
	3%	4%	5%	6%	7%	8%
6000	8,785	8,025	7,359	6,773	6,256	5,798
6500	12,700	11,601	10,638	9,791	9,044	8,381
7000	16,615	15,177	13,917	12,809	11,831	10,965
7500	20,529	18,753	17,197	15,827	14,619	13,548
8000	24,444	22,329	20,476	18,845	17,406	16,131
8500	28,359	25,905	23,755	21,863	20,194	18,715
9000	32,273	29,481	27,034	24,881	22,981	21,298
9500	36,188	33,057	30,313	27,990	25,769	23,882
10000	40,103	36,633	33,592	30,918	28,557	26,465
10500	44,017	40,209	36,871	33,936	31,344	29,049
11000	47,932	43,785	40,151	36,954	34,132	31,632
11500	51,847	47,361	43,430	39,972	36,919	34,215
12000	55,761	50,937	46,709	42,990	39,707	36,799

\* With a 20 year repayment period

For example, at a milk production level of 8,000 litres per cow, the contribution margin would be \$1,643 per cow. This margin, if amortized over 20 years at 5 percent interest, results in a debt carrying capacity of \$20,476 per cow.

Figure 29 shows the impact of milk productivity on the debt load carrying capacity of dairy enterprises given an interest rate of 5 percent. As productivity declines, the debt carrying capacity of each cow also declines. Conversely, the debt carrying capacity rises as productivity increases.



Another way to use this information is to measure the minimum level of productivity required to carry a given debt load at a specific interest rate. As an example, if a farm has a debt of \$15,000 per cow, then at an interest rate of 5 percent, this amount of debt per cow would be supported at production levels of about 6,975 litres per cow and above (Table 14). In general, as productivity increases and/or interest rates fall, debt repayment or financing capacity increases.

To this point, the value of quota has not been included in the analysis. If externally financed quota valued at \$32,473 per cow (the average value of total production quota for one cow in the 2011 Dairy Cost Study) is added to current debt of \$4,128 per cow, the total amount of debt load per cow would be \$36,601. The ability to carry this amount of debt per cow is dependent upon the prevailing interest rate and the productivity of each cow carrying debt. As illustrated in Table 14, this level of debt would require a production level of around 10,500 litres per cow, assuming an interest rate of 5 percent.

## Impact of Quota Values on Dairy Returns

The cost and return analysis in this study does not include any value for milk quota. However, new entrants into the dairy business would have to purchase quota. When the financing of these quota purchases (at 2011 Dairy Cost Study total production quota average price) is taken into account, the average rate of return for new entrants would be a negative 3.6 percent (Table 15). This means that the borrowing costs of capital used to purchase quota exceeded the financial returns obtained from producing milk. The assumption in this analysis is that all funds needed to purchase quota were borrowed at 4.72 percent, the average interest rate in the study.

**Table 15**

### Impact of Quota Value on Dairy Returns, 2011

	2011 Study Average	Including Quota Value*
--- \$ per Farm ---		
Dairy Investment	1,695,228	6,019,723
Debt	549,761	4,874,256
Equity	1,145,467	1,145,467
--- \$ per hL Sold ---		
Equity	98.85	98.85
Gross Income	84.02	84.02
Production Costs	70.00	70.00
Interest Cost for Quota		17.61
Potential Total Cost	70.00	87.61
Return to Equity(\$ per hL)	14.02	-3.59
Return to Equity (%)	14.2	-3.6

\*Applicable to new entrants who borrow 100 percent of funds needed to purchase total production quota at the average value from the 2011 Dairy Cost Study of \$36,071 per kg/day.



# **APPENDIX A**

## **2011 Dairy Cost Study Provincial Average**

**Alberta**  
**2011 Dairy Cost Study - Business Analysis**  
**52 Participants**  
**Table 1 Dairy Enterprise Costs and Returns**

	TOTAL ENTERPRISE	PER COW	PER HL SOLD	PERCENT FROM INCOME
<b>INCOME:</b>				
MILK SALES	917,042.05	6,886.01	79.15	
POOL ADJUSTMENTS (+ -)	(14.93)	(.11)	(.00)	
MISCELLANEOUS RECEIPTS	7,143.59	53.64	.62	
NET CATTLE SALES (+ -)	26,530.91	199.22	2.29	
NET INVENTORY CHANGE (+ -)	22,775.76	171.02	1.97	
<b>GROSS INCOME -----</b>	<b>973,477.37</b>	<b>7,309.78</b>	<b>84.02</b>	<b>100.00</b>
<b>EXPENSES:</b>				
GRAIN	43,416.15	326.01	3.75	
COMPLETE FEED	137,509.33	1,032.55	11.87	
SUPPLEMENT	34,075.48	255.87	2.94	
MINERALS & VITAMINS	8,000.95	60.08	.69	
ROUGHAGE	93,709.43	703.66	8.09	
PROCESSING COSTS	2,442.56	18.34	.21	
<b>TOTAL FEED COSTS -----</b>	<b>319,153.90</b>	<b>2,396.51</b>	<b>27.54</b>	<b>32.78</b>
BEDDING AND SUPPLIES	28,200.34	211.75	2.43	
BREEDING	11,111.68	83.44	.96	
VET. AND MEDICINE	20,635.98	154.95	1.78	
MILK HAULING	32,208.99	241.86	2.78	
PRODUCER'S FEES	21,437.11	160.97	1.85	
UTILITIES	19,895.87	149.32	1.72	
FUEL, OIL, LUBE	16,056.73	120.57	1.39	
BLDG. & MACH. REPAIRS	27,760.57	208.45	2.40	
MISCELLANEOUS	35,498.05	266.56	3.06	
<b>TOTAL OTHER VARIABLE COSTS ----</b>	<b>212,795.31</b>	<b>1,597.87</b>	<b>18.37</b>	<b>21.86</b>
HIREN LABOUR	39,019.58	293.00	3.37	
FAMILY LABOUR	98,721.48	741.29	8.52	
<b>TOTAL LABOUR COSTS -----</b>	<b>137,741.06</b>	<b>1,034.29</b>	<b>11.89</b>	<b>14.15</b>
<b>TOTAL VARIABLE COSTS</b>	<b>669,690.28</b>	<b>5,028.66</b>	<b>57.80</b>	<b>68.79</b>
RENT	1,977.03	14.85	.17	
TAXES AND INSURANCE	17,249.51	129.53	1.49	
DEPRECIATION	96,185.87	722.25	8.30	
INTEREST (CAP.DEBT)	25,955.39	194.90	2.24	
<b>TOTAL CAPITAL COSTS -----</b>	<b>141,367.80</b>	<b>1,061.52</b>	<b>12.20</b>	<b>14.52</b>
<b>TOTAL PRODUCTION COSTS</b>	<b>811,058.08</b>	<b>6,090.18</b>	<b>70.00</b>	<b>83.32</b>
CONTRIBUTION MARGIN (\$)	303,787.10	2,281.12	26.22	
RETURN TO EQUITY (\$)	162,419.29	1,219.60	14.02	16.68
MILK PRICE			79.14	
INVENTORY ADJUSTMENT			4.87	
RETURN TO EQUITY (%)			14.18	
AVERAGE CAP. DEBT INTEREST RATE (%)			4.72	

**Alberta  
2011 Dairy Cost Study - Business Analysis  
52 Participants**

**Table 2 Statement of Investment**

<u>LAND BUILDINGS &amp; EQUIPMENT</u>	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	11.18	38,341.21	944,554.75
POWER MACHINERY	7.64	19,639.08	132,292.30
DAIRY EQUIPMENT	9.78	25,013.75	105,136.11
OTHER EQUIPMENT	7.42	13,191.83	60,632.35
<b>TOTAL EQUIPMENT</b>	<b>8.32</b>	<b>57,844.66</b>	<b>298,060.76</b>
LAND			78,429.76
SUPPLIES			15,370.97
<b>** SUBTOTAL **</b>		<b>96,185.87</b>	<b>1,336,416.23</b>

<u>DAIRY LIVESTOCK</u>	--- BEGIN YEAR ---		--- END OF YEAR ---		AVERAGE VALUE
	NUMBER	VALUE	NUMBER	VALUE	
COWS	129.15	240,702.59	136.71	254,787.77	247,745.18
BRED HEIFERS	36.12	57,784.62	39.77	63,630.77	60,707.69
OPEN HEIFERS	38.04	38,038.46	40.63	40,634.62	39,336.54
HEIFER CALVES	42.85	8,569.23	43.69	8,738.46	8,653.85
BULL CALVES	4.54	136.15	6.21	186.35	161.25
BULLS	1.46	2,192.31	1.48	2,221.15	2,206.73
<b>** SUBTOTAL **</b>	<b>252.15</b>	<b>347,423.35</b>	<b>268.50</b>	<b>370,199.12</b>	<b>358,811.24</b>

<b>TOTAL DAIRY INVESTMENT</b> -----	<b>1,695,227.47</b>
CAPITAL LOANS	549,761.40
OPERATOR EQUITY	1,145,466.07
INVESTMENT PER COW	12,729.35
DEBT/CAPITAL RATIO	.32
CAPITAL TURNOVER ( YR )	1.74

<u>HERD SIZE</u>	Average	Median
NUMBER OF DAIRY COWS	133.17	113.83
NUMBER OF ANIMAL UNITS	204.89	180.71
DRY COWS ( % )	19.39	
CALF CROP ( % )	100.75	
PASTURE PER COW ( AC. )	.22	

<u>CATTLE SALES &amp; PURCHASES</u>	NUMBER SOLD	SELLING PRICE	NUMBER PURCHASED	PURCHASE PRICE
COWS	33.62	887.30	2.21	1,942.17
BRED HEIFERS	.77	1,821.91	1.62	1,660.71
OPEN HEIFERS	.54	671.98	.35	1,668.50
HEIFER CALVES	1.40	136.92	.02	350.00
BULL CALVES	40.62	70.00	.00	.00
BULLS	1.00	1,768.93	.92	2,493.02
<b>TOTAL VALUE</b>		<b>36,394.33</b>		<b>9,863.42</b>

**Alberta**  
**2011 Dairy Cost Study - Business Analysis**  
**52 Participants**  
**Table 3 Labour and Management**

**LABOUR**

	HOURS	VALUE	HOURLY RATE
OPERATOR LABOUR	3,097.74	63,503.68	20.50
HIRED LABOUR	1,906.97	39,019.58	20.46
FAMILY UNPAID LABOUR	1,761.38	35,217.81	19.99
<b>TOTAL</b>	<b>6,766.10</b>	<b>137,741.06</b>	<b>20.36</b>
RETURN TO FAMILY LABOUR	27.81		
MAN EQUIVALENTS	2.71		
LABOUR HOURS PER COW	50.81		
YEARS FARMING	21.76		

**MILK PRODUCTION**

	HL.	% OF TOTAL	VALUE	AVERAGE PRICE / HL
MILK SALES	11,585.77	97.05	917,042.05	79.15
OTHER MILK PRODUCED	351.33	2.94		
<b>TOTAL</b>	<b>11,938.01</b>	<b>100.00</b>		

**AVERAGE COMPONENT PRICES (\$ / KG)**

BUTTERFAT TEST	3.90 KG / HL	11.42
PROTEIN	3.29 KG / HL	3.82
L.O.S.	5.66 KG / HL	3.77
MILK PRODUCTION PER COW	8,964.17 LITRES / YEAR	

**QUOTA INFORMATION**

TPQ HOLDINGS	119.89 KG / DAY
TPQ PRICE	36,070.52 \$ / KG / DAY
CREDIT PRICE	6.27 \$ / KG

**MANAGEMENT FACTORS**

COST PER HL	70.00
MILK/FEED (KG) RATIO	2.07 LITRES
MILK/LABOUR (HR) RATIO	176.44 LITRES
MILK/CAPITAL (\$) RATIO	.70 LITRES

**Alberta**  
**2011 Dairy Cost Study - Business Analysis**  
**52 Participants**  
**Table 4 Feed Report**

	-- PURCHASED --		-- HOMEGROWN--	
<u>CONCENTRATES</u>	QUANTITY (TONNES)	PRICE	QUANTITY (TONNES)	PRICE
OATS	.52	95.90	2.17	185.04
BARLEY	55.23	187.92	95.28	190.89
WHEAT	1.63	195.00	2.87	201.37
MIXED GRAIN	.35	288.00	.00	.00
BREW GRAIN (DRY EQ.)	10.18	167.74		
BEET PULP	1.81	211.28		
OTHER PURCHASED	47.65	237.46		
DAIRY RATION	260.98	483.52		
CALF FEED	19.44	464.77		
MILK REPLACER	.72	3,156.84		
SUPPLEMENT	68.69	489.90		
MOLASSES	1.21	348.57		
SALT	.65	329.52		
MINERALS & VITAMINS	7.37	1,055.82		
<b>SUBTOTAL -----</b>	<b>476.43</b>	<b>203,834.93</b>	<b>100.32</b>	<b>19,166.97</b>
 <u>ROUGHAGE</u>				
ALFALFA HAY	117.91	135.25	132.60	92.69
ALFALFA PELLETS	.00	.00		
STRAW FED	5.51	53.32	25.63	48.35
GREENFEED	.00	.00	3.10	65.55
SILAGE/HAYLAGE (DRY EQ.)	180.90	121.60	498.74	83.69
<b>SUBTOTAL -----</b>	<b>304.32</b>	<b>38,237.93</b>	<b>660.07</b>	<b>55,471.51</b>
 GRINDING & PROCESSING		2,442.56		
<b>GRAND TOTAL FEED COSTS -----</b>		<b>244,515.42</b>		<b>74,638.48</b>
 BEDDING	136.25	64.41	35.09	48.99
 AV. PRICE:	CONCENTRATE	386.66 \$/TONNE		
	ROUGHAGE	97.17 \$/TONNE		
 FED PER COW:	CONCENTRATE	4.33 TONNES		
	ROUGHAGE	7.24 TONNES		
 % HOME GROWN:	CONCENTRATE	17.39 %		
	ROUGHAGE	68.44 %		

# **APPENDIX B**

## **2011 Dairy Cost Study**

### **Northern Alberta**

**Northern Alberta**  
**2011 Dairy Cost Study - Business Analysis**  
**20 Participants**  
**Table 1 Dairy Enterprise Costs and Returns**

	TOTAL ENTERPRISE	PER COW	PER HL SOLD	PERCENT FROM INCOME
<b>INCOME:</b>				
MILK SALES	758,096.60	6,511.23	78.30	
POOL ADJUSTMENTS (+ -)	19.25	.17	.00	
MISCELLANEOUS RECEIPTS	7,618.40	65.43	.79	
NET CATTLE SALES (+ -)	27,466.94	235.93	2.84	
NET INVENTORY CHANGE (+ -)	14,888.20	127.87	1.54	
<b>GROSS INCOME -----</b>	<b>808,091.39</b>	<b>6,940.63</b>	<b>83.46</b>	<b>100.00</b>
<b>EXPENSES:</b>				
GRAIN	36,108.75	310.13	3.73	
COMPLETE FEED	100,085.15	859.62	10.34	
SUPPLEMENT	29,506.11	253.43	3.05	
MINERALS & VITAMINS	4,611.06	39.60	.48	
ROUGHAGE	90,417.53	776.59	9.34	
PROCESSING COSTS	6,049.41	51.96	.62	
<b>TOTAL FEED COSTS -----</b>	<b>266,778.01</b>	<b>2,291.33</b>	<b>27.55</b>	<b>33.01</b>
BEDDING AND SUPPLIES	24,707.27	212.21	2.55	
BREEDING	10,853.88	93.22	1.12	
VET. AND MEDICINE	20,157.21	173.13	2.08	
MILK HAULING	27,502.89	236.22	2.84	
PRODUCER'S FEES	17,856.92	153.37	1.84	
UTILITIES	17,622.16	151.36	1.82	
FUEL, OIL, LUBE	12,068.60	103.66	1.25	
BLDG. & MACH. REPAIRS	20,307.34	174.42	2.10	
MISCELLANEOUS	37,324.44	320.58	3.85	
<b>TOTAL OTHER VARIABLE COSTS ----</b>	<b>188,400.50</b>	<b>1,618.16</b>	<b>19.46</b>	<b>23.31</b>
HIRED LABOUR	39,074.53	335.61	4.04	
FAMILY LABOUR	89,718.35	770.58	9.27	
<b>TOTAL LABOUR COSTS -----</b>	<b>128,792.88</b>	<b>1,106.19</b>	<b>13.30</b>	<b>15.94</b>
<b>TOTAL VARIABLE COSTS</b>	<b>583,971.39</b>	<b>5,015.68</b>	<b>60.31</b>	<b>72.27</b>
RENT	2,404.50	20.65	.25	
TAXES AND INSURANCE	18,055.53	155.08	1.86	
DEPRECIATION	80,723.90	693.33	8.34	
INTEREST (CAP.DEBT)	19,596.70	168.31	2.02	
<b>TOTAL CAPITAL COSTS -----</b>	<b>120,780.63</b>	<b>1,037.37</b>	<b>12.47</b>	<b>14.95</b>
<b>TOTAL PRODUCTION COSTS</b>	<b>704,752.03</b>	<b>6,053.05</b>	<b>72.79</b>	<b>87.21</b>
<b>CONTRIBUTION MARGIN (\$)</b>	<b>224,119.99</b>	<b>1,924.95</b>	<b>23.15</b>	
<b>RETURN TO EQUITY (\$)</b>	<b>103,339.36</b>	<b>887.57</b>	<b>10.67</b>	<b>12.79</b>
MILK PRICE			78.30	
INVENTORY ADJUSTMENT			5.16	
RETURN TO EQUITY (%)			11.15	
AVERAGE CAP. DEBT INTEREST RATE (%)			4.20	

**Northern Alberta  
2011 Dairy Cost Study - Business Analysis  
20 Participants**

**Table 2 Statement of Investment**

**LAND BUILDINGS & EQUIPMENT**

	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	12.37	30,644.34	762,275.45
POWER MACHINERY	7.72	16,361.58	110,086.46
DAIRY EQUIPMENT	10.10	23,594.81	97,914.63
OTHER EQUIPMENT	8.20	10,123.17	45,213.32
<b>TOTAL EQUIPMENT</b>	<b>8.72</b>	<b>50,079.56</b>	<b>253,214.41</b>
LAND			58,308.63
SUPPLIES			17,730.31
<b>** SUBTOTAL **</b>		<b>80,723.90</b>	<b>1,091,528.79</b>

**DAIRY LIVESTOCK**

	--- BEGIN YEAR ---		--- END OF YEAR ---		AVERAGE VALUE
	NUMBER	VALUE	NUMBER	VALUE	
COWS	113.10	205,808.95	119.25	217,000.15	211,404.55
BRED HEIFERS	26.95	43,120.00	29.05	46,480.00	44,800.00
OPEN HEIFERS	37.70	37,700.00	36.95	36,950.00	37,325.00
HEIFER CALVES	38.20	7,640.00	42.75	8,550.00	8,095.00
BULL CALVES	4.95	148.50	8.35	250.50	199.50
BULLS	.50	750.00	.55	825.00	787.50
<b>** SUBTOTAL **</b>	<b>221.40</b>	<b>295,167.45</b>	<b>236.90</b>	<b>310,055.65</b>	<b>302,611.55</b>

<b>TOTAL DAIRY INVESTMENT</b> -----	<b>1,394,140.34</b>
CAPITAL LOANS	466,931.72
OPERATOR EQUITY	927,208.62
INVESTMENT PER COW	11,974.15
DEBT/CAPITAL RATIO	.33
CAPITAL TURNOVER ( YR )	1.73

**HERD SIZE**

	Average	Median
NUMBER OF DAIRY COWS	116.43	78.96
NUMBER OF ANIMAL UNITS	178.01	119.00
DRY COWS ( % )	20.91	
CALF CROP ( % )	106.89	
PASTURE PER COW ( AC. )	.24	

**CATTLE SALES & PURCHASES**

	NUMBER SOLD	SELLING PRICE	NUMBER PURCHASED	PURCHASE PRICE
COWS	28.80	928.37	1.15	1,532.61
BRED HEIFERS	1.20	2,100.85	.70	2,000.00
OPEN HEIFERS	.30	719.67	.55	2,457.55
HEIFER CALVES	.60	324.58	.00	.00
BULL CALVES	40.10	61.67	.00	.00
BULLS	.20	1,259.75	.15	1,500.00
<b>TOTAL VALUE</b>		<b>32,208.09</b>		<b>4,739.15</b>



**Northern Alberta  
2011 Dairy Cost Study - Business Analysis  
20 Participants  
Table 3 Labour and Management**

**LABOUR**

	HOURS	VALUE	HOURLY RATE
OPERATOR LABOUR	2,612.57	53,557.79	20.50
HIRED LABOUR	1,850.60	39,074.53	21.11
FAMILY UNPAID LABOUR	1,798.85	36,160.56	20.10
<b>TOTAL</b>	<b>6,262.02</b>	<b>128,792.88</b>	<b>20.57</b>
RETURN TO FAMILY LABOUR	20.84		
MAN EQUIVALENTS	2.50		
LABOUR HOURS PER COW	53.78		
YEARS FARMING	21.98		

**MILK PRODUCTION**

	HL.	% OF TOTAL	VALUE	AVERAGE PRICE / HL
MILK SALES	9,679.77	97.08	758,096.60	78.32
OTHER MILK PRODUCED	289.26	2.90		
<b>TOTAL</b>	<b>9,971.39</b>	<b>100.00</b>		

**AVERAGE COMPONENT PRICES (\$ / KG)**

BUTTERFAT TEST	3.93 KG / HL	11.53
PROTEIN	3.29 KG / HL	3.83
L.O.S.	5.67 KG / HL	3.79
MILK PRODUCTION PER COW	8,564.34 LITRES / YEAR	

**QUOTA INFORMATION**

TPQ HOLDINGS	101.13 KG / DAY
TPQ PRICE	36,863.34 \$ / KG / DAY
CREDIT PRICE	6.43 \$ / KG

**MANAGEMENT FACTORS**

COST PER HL	72.79
MILK/FEED (KG) RATIO	2.10 LITRES
MILK/LABOUR (HR) RATIO	159.24 LITRES
MILK/CAPITAL (\$) RATIO	.72 LITRES

**Northern Alberta  
2011 Dairy Cost Study - Business Analysis  
20 Participants  
Table 4 Feed Report**

<u>CONCENTRATES</u>	-- PURCHASED --		-- HOMEGROWN--	
	QUANTITY (TONNES)	PRICE	QUANTITY (TONNES)	PRICE
OATS	.00	.00	.00	.00
BARLEY	108.79	186.18	45.02	168.97
WHEAT	.00	.00	.00	.00
MIXED GRAIN	.00	.00	.00	.00
BREW GRAIN (DRY EQ. )	14.93	178.94		
BEET PULP	2.36	221.44		
OTHER PURCHASED	16.06	314.43		
DAIRY RATION	201.04	459.65		
CALF FEED	13.56	475.55		
MILK REPLACER	.39	3,111.84		
SUPPLEMENT	68.97	421.26		
MOLASSES	.75	600.00		
SALT	.59	380.54		
MINERALS & VITAMINS	3.10	1,413.24		
<b>SUBTOTAL -----</b>	<b>430.57</b>	<b>162,703.36</b>	<b>45.02</b>	<b>7,607.71</b>
 <u>ROUGHAGE</u>				
ALFALFA HAY	106.89	126.90	82.11	94.84
ALFALFA PELLETS	.00	.00		
STRAW FED	8.48	52.00	19.51	40.09
GREENFEED	.00	.00	3.46	66.34
SILAGE/HAYLAGE (DRY EQ.)	303.89	129.17	331.93	85.51
<b>SUBTOTAL -----</b>	<b>419.07</b>	<b>53,234.62</b>	<b>437.01</b>	<b>37,182.91</b>
GRINDING & PROCESSING		6,049.41		
<b>GRAND TOTAL FEED COSTS -----</b>		<b>221,987.39</b>		<b>44,790.62</b>
BEDDING	148.02	62.18	22.68	40.33
AV. PRICE:	CONCENTRATE	358.11 \$/TONNE		
	ROUGHAGE	105.62 \$/TONNE		
FED PER COW:	CONCENTRATE	4.08 TONNES		
	ROUGHAGE	7.35 TONNES		
% HOME GROWN:	CONCENTRATE	9.47 %		
	ROUGHAGE	51.05 %		

# **APPENDIX C**

## **2011 Dairy Cost Study Southern Alberta**

**Southern Alberta**  
**2011 Dairy Cost Study - Business Analysis**  
**32 Participants**  
**Table 1 Dairy Enterprise Costs and Returns**

	TOTAL ENTERPRISE	PER COW	PER HL SOLD	PERCENT FROM INCOME
<b>INCOME:</b>				
MILK SALES	1,016,382.95	7,075.87	79.55	
POOL ADJUSTMENTS (+ -)	(36.30)	(.25)	(.00)	
MISCELLANEOUS RECEIPTS	6,846.83	47.67	.54	
NET CATTLE SALES (+ -)	25,944.65	180.62	2.03	
NET INVENTORY CHANGE (+ -)	27,724.43	193.01	2.17	
<b>GROSS INCOME -----</b>	<b>1,076,862.56</b>	<b>7,496.92</b>	<b>84.28</b>	<b>100.00</b>
<b>EXPENSES:</b>				
GRAIN	47,983.27	334.05	3.76	
COMPLETE FEED	160,899.44	1,120.15	12.59	
SUPPLEMENT	36,931.33	257.11	2.89	
MINERALS & VITAMINS	10,119.64	70.45	.79	
ROUGHAGE	95,766.88	666.71	7.50	
PROCESSING COSTS	188.28	1.31	.01	
<b>TOTAL FEED COSTS -----</b>	<b>351,888.83</b>	<b>2,449.79</b>	<b>27.54</b>	<b>32.68</b>
BEDDING AND SUPPLIES	30,383.51	211.52	2.38	
BREEDING	11,272.80	78.48	.88	
VET. AND MEDICINE	20,935.21	145.75	1.64	
MILK HAULING	35,150.43	244.71	2.75	
PRODUCER'S FEES	23,674.73	164.82	1.85	
UTILITIES	21,300.69	148.29	1.67	
FUEL, OIL, LUBE	18,549.31	129.14	1.45	
BLDG. & MACH. REPAIRS	32,418.84	225.69	2.54	
MISCELLANEOUS	34,356.55	239.18	2.69	
<b>TOTAL OTHER VARIABLE COSTS ----</b>	<b>228,042.07</b>	<b>1,587.59</b>	<b>17.85</b>	<b>21.18</b>
HIREN LABOUR	38,985.24	271.41	3.05	
FAMILY LABOUR	104,348.44	726.45	8.17	
<b>TOTAL LABOUR COSTS -----</b>	<b>143,333.68</b>	<b>997.86</b>	<b>11.22</b>	<b>13.31</b>
<b>TOTAL VARIABLE COSTS</b>	<b>723,264.58</b>	<b>5,035.24</b>	<b>56.61</b>	<b>67.16</b>
RENT	1,709.86	11.90	.13	
TAXES AND INSURANCE	16,745.74	116.58	1.31	
DEPRECIATION	105,849.61	736.91	8.28	
INTEREST (CAP.DEBT)	29,929.58	208.36	2.34	
<b>TOTAL CAPITAL COSTS -----</b>	<b>154,234.79</b>	<b>1,073.75</b>	<b>12.07</b>	<b>14.32</b>
<b>TOTAL PRODUCTION COSTS</b>	<b>877,499.37</b>	<b>6,108.99</b>	<b>68.68</b>	<b>81.49</b>
CONTRIBUTION MARGIN (\$)	353,597.98	2,461.69	27.67	
RETURN TO EQUITY (\$)	199,363.19	1,387.93	15.60	18.51
MILK PRICE			79.54	
INVENTORY ADJUSTMENT			4.74	
RETURN TO EQUITY (%)			15.56	
AVERAGE CAP. DEBT INTEREST RATE (%)			4.98	

**Southern Alberta  
2011 Dairy Cost Study - Business Analysis  
32 Participants  
Table 2 Statement of Investment**

**LAND BUILDINGS & EQUIPMENT**

	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	10.61	43,151.76	1,058,206.14
POWER MACHINERY	7.60	21,687.52	146,164.67
DAIRY EQUIPMENT	9.60	25,900.58	109,649.39
OTHER EQUIPMENT	7.11	15,109.75	70,244.05
<b>TOTAL EQUIPMENT</b>	<b>8.14</b>	<b>62,697.85</b>	<b>326,058.11</b>
LAND			91,005.47
SUPPLIES			13,896.38
<b>** SUBTOTAL **</b>		<b>105,849.61</b>	<b>1,489,166.09</b>

**DAIRY LIVESTOCK**

	--- BEGIN YEAR ---		--- END OF YEAR ---		AVERAGE VALUE
	NUMBER	VALUE	NUMBER	VALUE	
COWS	139.19	262,503.40	147.63	278,416.27	270,459.84
BRED HEIFERS	41.84	66,950.00	46.47	74,350.00	70,650.00
OPEN HEIFERS	38.25	38,250.00	42.94	42,937.50	40,593.75
HEIFER CALVES	45.75	9,150.00	44.28	8,856.25	9,003.13
BULL CALVES	4.28	128.44	4.88	146.25	137.34
BULLS	2.06	3,093.75	2.06	3,093.75	3,093.75
<b>** SUBTOTAL **</b>	<b>271.38</b>	<b>380,075.59</b>	<b>288.25</b>	<b>407,800.02</b>	<b>393,937.81</b>

<b>TOTAL DAIRY INVESTMENT</b> .....	<b>1,883,103.90</b>
CAPITAL LOANS	601,529.95
OPERATOR EQUITY	1,281,573.95
INVESTMENT PER COW	13,109.83
DEBT/CAPITAL RATIO	.32
CAPITAL TURNOVER ( YR )	1.75

**HERD SIZE**

	Average	Median
NUMBER OF DAIRY COWS	143.64	130.67
NUMBER OF ANIMAL UNITS	221.69	210.08
DRY COWS ( % )	18.62	
CALF CROP ( % )	97.64	
PASTURE PER COW ( AC. )	.21	

**CATTLE SALES & PURCHASES**

	NUMBER SOLD	SELLING PRICE	NUMBER PURCHASED	PURCHASE PRICE
COWS	36.75	867.33	2.88	2,044.57
BRED HEIFERS	.50	1,403.51	2.19	1,592.86
OPEN HEIFERS	.89	658.98	.22	428.57
HEIFER CALVES	1.91	100.00	.03	350.00
BULL CALVES	40.94	75.09	.00	.00
BULLS	1.50	1,811.36	1.41	2,569.22
<b>TOTAL VALUE</b>		<b>39,010.74</b>		<b>13,066.09</b>

**Southern Alberta  
2011 Dairy Cost Study - Business Analysis  
32 Participants  
Table 3 Labour and Management**

<u>LABOUR</u>	HOURS	VALUE	HOURLY RATE	
OPERATOR LABOUR	3,400.97	69,719.86	20.50	
HIRED LABOUR	1,942.21	38,985.24	20.07	
FAMILY UNPAID LABOUR	1,737.96	34,628.58	19.92	
<b>TOTAL</b>	<b>7,081.14</b>	<b>143,333.68</b>	<b>20.24</b>	
RETURN TO FAMILY LABOUR	31.67			
MAN EQUIVALENTS	2.83			
LABOUR HOURS PER COW	49.30			
YEARS FARMING	21.63			
<u>MILK PRODUCTION</u>	HL.	% OF TOTAL	VALUE	AVERAGE PRICE / HL
MILK SALES	12,777.02	97.04	1,016,382.95	79.55
OTHER MILK PRODUCED	390.12	2.96		
<b>TOTAL</b>	<b>13,167.14</b>	<b>100.00</b>		
				<b>AVERAGE COMPONENT PRICES (\$ / KG)</b>
BUTTERFAT TEST	3.88 KG / HL			11.37
PROTEIN	3.28 KG / HL			3.82
L.O.S.	5.65 KG / HL			3.76
MILK PRODUCTION PER COW	9,166.72 LITRES / YEAR			
<u>QUOTA INFORMATION</u>				
TPQ HOLDINGS	131.62 KG / DAY			
TPQ PRICE	34,722.25 \$ / KG / DAY			
CREDIT PRICE	6.22 \$ / KG			
<u>MANAGEMENT FACTORS</u>				
COST PER HL	68.68			
MILK/FEED (KG) RATIO	2.08 LITRES			
MILK/LABOUR (HR) RATIO	185.95 LITRES			
MILK/CAPITAL (\$) RATIO	.70 LITRES			

Southern Alberta  
2011 Dairy Cost Study - Business Analysis  
32 Participants  
Table 4 Feed Report

<u>CONCENTRATES</u>	--- PURCHASED ---		--- HOMEGROWN---	
	QUANTITY (TONNES)	PRICE	QUANTITY (TONNES)	PRICE
OATS	.85	95.90	3.52	185.04
BARLEY	21.75	193.36	126.69	195.76
WHEAT	2.64	195.00	4.86	201.37
MIXED GRAIN	.56	288.00	.00	.00
BREW GRAIN (DRY EQ. )	7.21	153.24		
BEET PULP	1.46	200.99		
OTHER PURCHASED	67.39	226.00		
DAIRY RATION	298.44	493.57		
CALF FEED	23.11	460.82		
MILK REPLACER	.93	3,168.78		
SUPPLEMENT	68.52	533.09		
MOLASSES	1.50	270.00		
SALT	.89	302.01		
MINERALS & VITAMINS	10.04	986.81		
SUBTOTAL -----	505.09	229,542.16	134.87	26,391.51
<u>ROUGHAGE</u>				
ALFALFA HAY	124.79	139.73	164.16	92.02
ALFALFA PELLETS	.00	.00		
STRAW FED	3.66	55.23	29.45	51.77
GREENFEED	.00	.00	2.88	64.96
SILAGE/HAYLAGE (DRY EQ.)	104.15	107.79	603.00	83.06
SUBTOTAL -----	232.60	28,864.99	799.49	66,901.88
GRINDING & PROCESSING		188.28		
GRAND TOTAL FEED COSTS -----		258,595.44		93,293.39
BEDDING	128.90	66.00	42.85	51.86
AV. PRICE:	CONCENTRATE	399.92 \$/TONNE		
	ROUGHAGE	92.79 \$/TONNE		
FED PER COW:	CONCENTRATE	4.46 TONNES		
	ROUGHAGE	7.19 TONNES		
% HOME GROWN:	CONCENTRATE	21.08 %		
	ROUGHAGE	77.46 %		

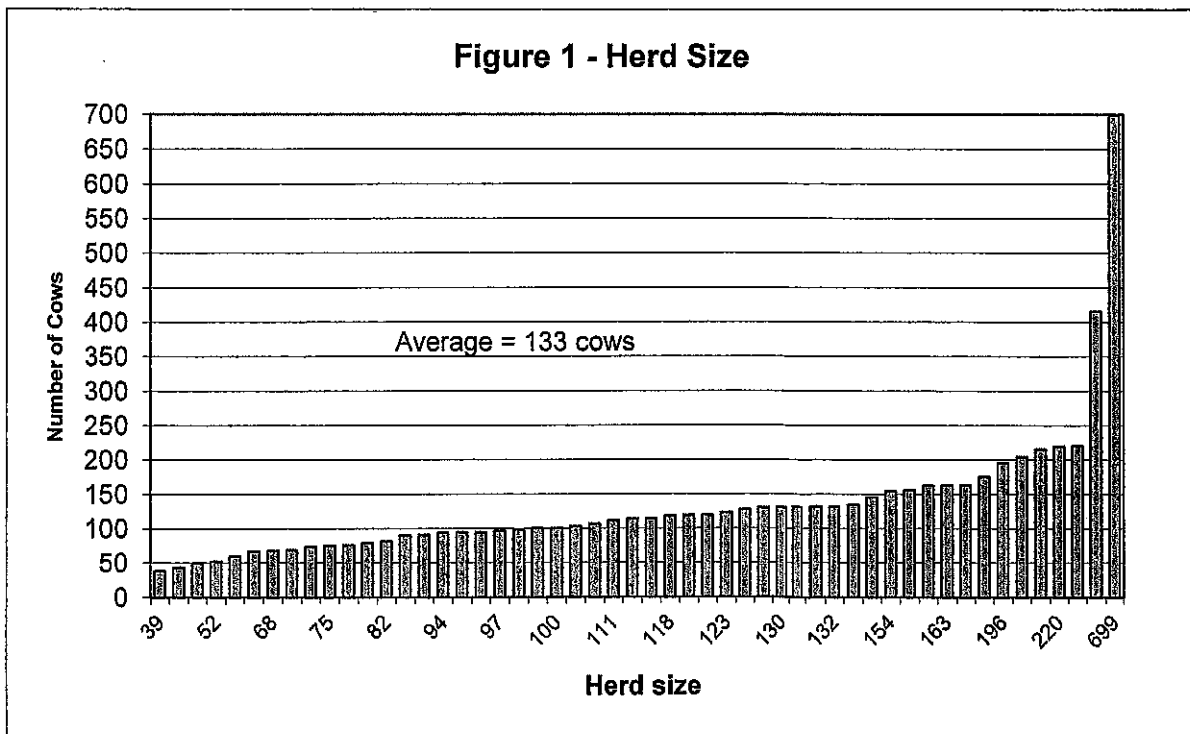
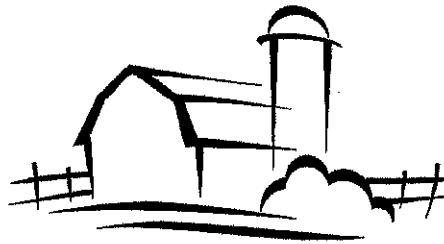
# **APPENDIX D**

## **2011 Dairy Cost Study Individual Results (52 Participants)**

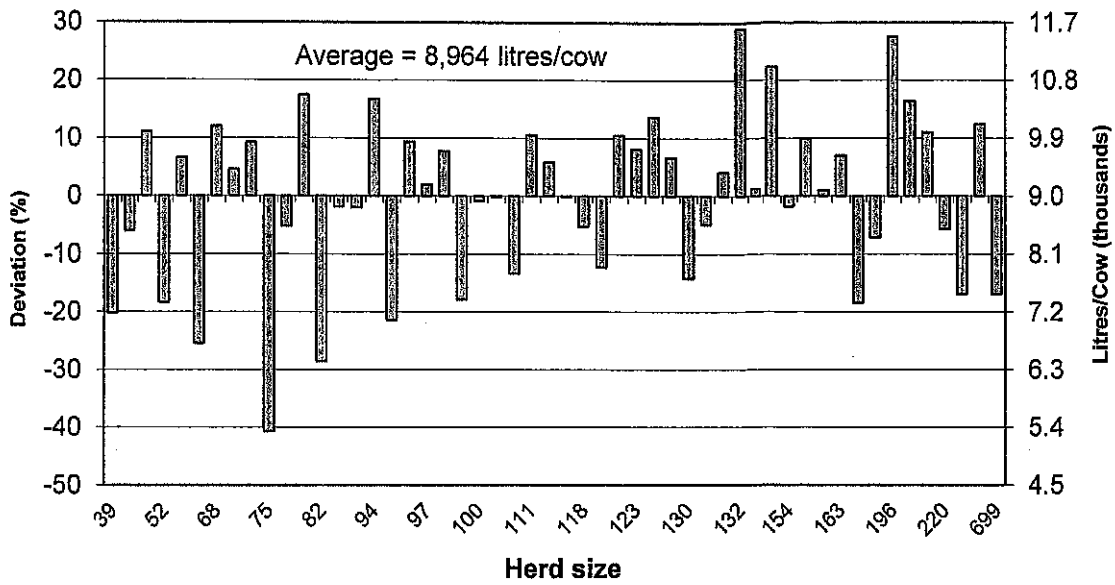


# Dairy Cost Study 2011

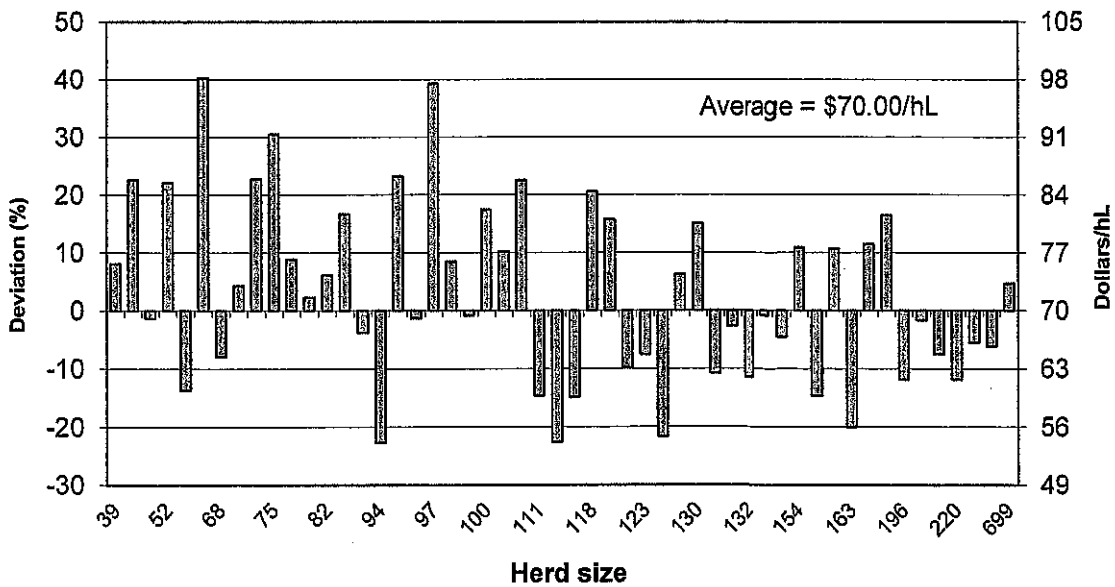
## Individual Results (52 Participants)



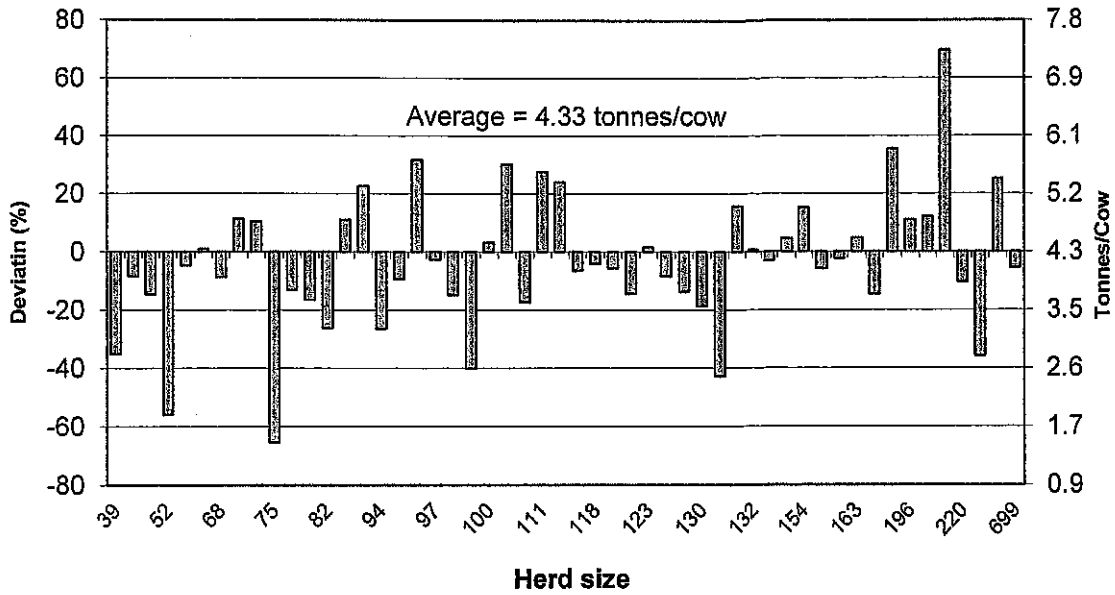
**Figure 2 - Milk Production  
(Litres/Cow)**



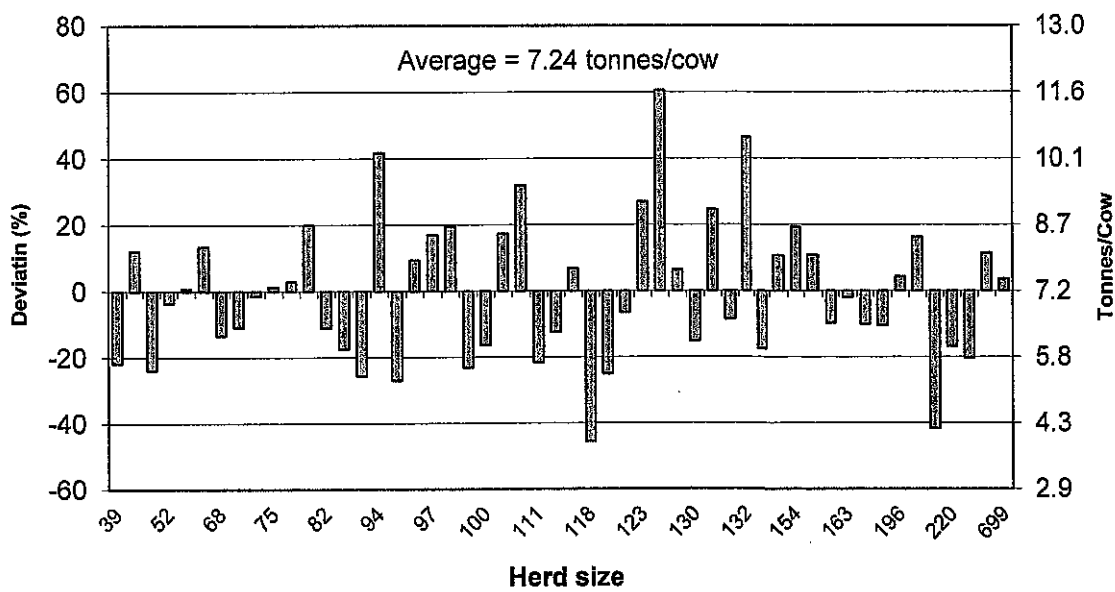
**Figure 3 - Cost of Production  
(Dollars/hL)**



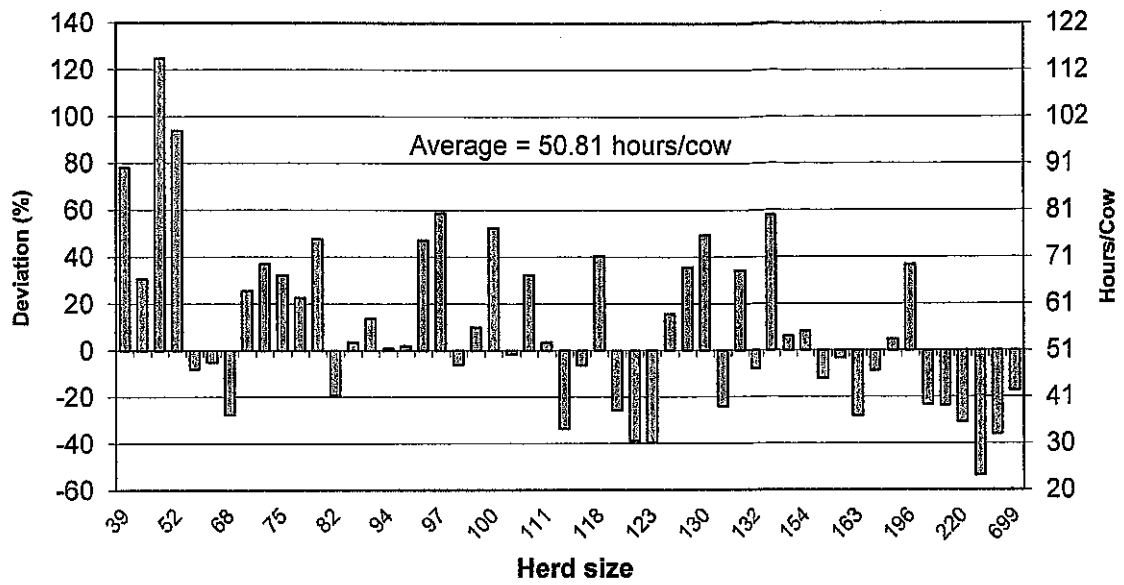
**Figure 4 - Concentrate Use  
(Tonnes/Cow)**



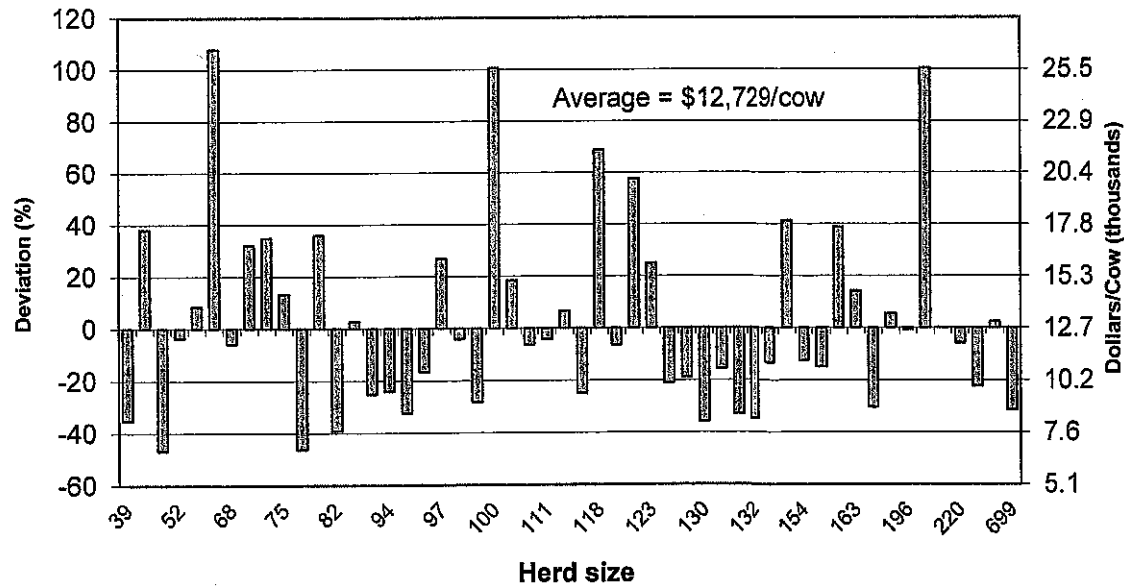
**Figure 5 - Roughage Use  
(Tonnes/Cow)**



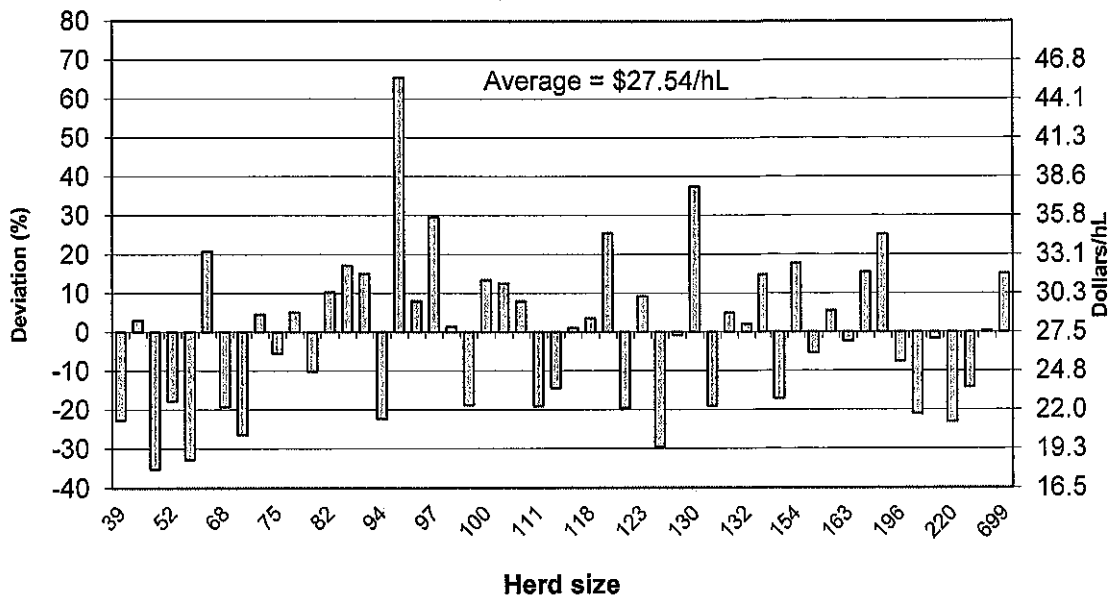
**Figure 6 - Labour Use  
(Hours/Cow)**



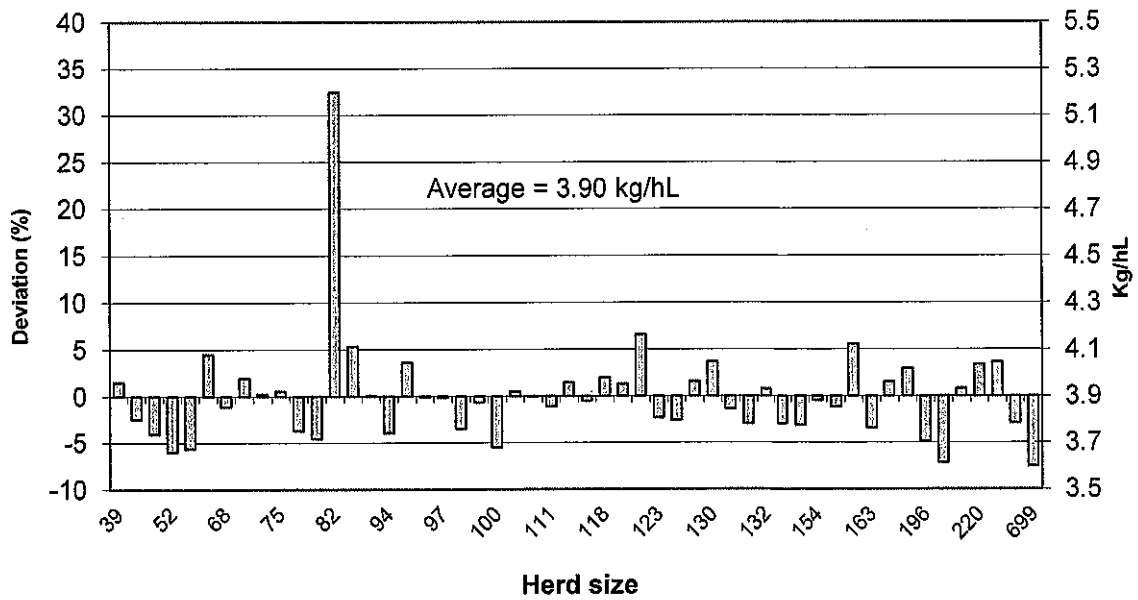
**Figure 7 - Investment  
(Dollars/Cow)**



**Figure 8 - Total Feed Cost  
(Dollars/hL)**



**Figure 9 - Butterfat Test  
(Kg/hL)**



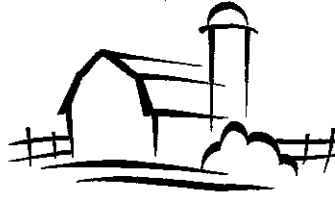
# **APPENDIX E**

## **2011 Dairy Cost Study Data Collection Forms**

# DAIRY COST STUDY, 2011

## Investments and Liabilities

Confidential



### General Information

Name:	TPQ Holdings kg/day: (January 2011)	
E-Mail:	Number of Years in Dairy	
Fax:		

### Land Information

	Total Acres	\$ per Acre	% to Dairy	% to Other Farm
Building Site				
Pasture				
Crop / Hay Land				

### Farm Loans

		Balance: Jan. 1, 2011	Interest Rate	% to Dairy	% to Other Farm
1	Land:				
1					
2	Building:				
2					
3	Livestock:				
3					
4	Machinery:				
4					
5	Other:				

### Supplies Inventory

		Value: Jan. 1, 2011	% to Dairy	% to Other Farm
1	Gas, Oil & Grease			
2	Vet., Semen, Etc			
3	Bedding			
4	Dairy Livestock Supplies (ie. pails)			
5	Rations & Supplements			
6	Other Supplies (ie. filters, soaps, etc.)			

If you have any questions, please call Pauline Van Biert at 780-415-2153, toll free by first dialing 310-0000

# DAIRY COST STUDY, 2011

Machinery and Buildings on Jan.1, 2011

Name: \_\_\_\_\_

Buildings Used for Dairy:		Purchased Price	Year Purchased	% to Dairy	% to Other Farm
1					
1					
1					
1					
1					
1					
1					
1					
1					
1					

Examples: barns, machine shed, hay sheds, bunkers, shop, calf hutches, corrals

## Tractors & Trucks Used for Dairy:

2					
2					
2					
2					
2					
2					
2					
2					
2					

## Dairy Equipment:

3					
3					
3					
3					
3					
3					
3					
3					
3					
3					
3					

Examples: bulk tank, pipeline, milk meters, washer, vacuum pump, generator, buckets





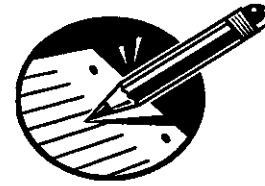
Other Equipment Used for Dairy:	Purchased Price	Year Purchased	% to Dairy	% to Other Farm
4				
4				
4				
4				
4				
4				
4				
4				
4				
4				
4				
4				
4				
4				
4				
4				
4				

Examples: manure spreader, barn cleaner, manure pump, cattle trailer, quad, bale feeders, silo unloader, scraper, feed mixers, sawdust blowers, semen tank, fencers, fans, crowd gate, small tools (table saw, drill press, welder, power tools), fuel tanks, wheel barrows, computer feeding system, home computer

# DAIRY COST STUDY, 2011

## Monthly Reporting Sheet

**Confidential**



Name: \_\_\_\_\_

Month: \_\_\_\_\_

If you have any questions, please call Pauline Van Biert at 780-415-2153, toll free by first dialing 310-0000

Dairy Herd	Beginning No.	Purchases		No. Born	Died or Trans/Out	Sales		End No.
		No.	Total Value			No.	Total Value	
1. Milking Cows								
2. Dry Cows								
3. Bred Heifers								
4. Open Heifers								
5. Heifer Calves								
6. Bull Calves*								
7. Herd Bulls								

\*less than 6 months

Capital Purchases			Total Value (\$)	% to Dairy	% to Other Farm
Specify					
1. Equipment	Purchases:				
2.	Sales:				
3. Tractor/Truck	Purchases:				
4.	Sales:				
5. Buildings	Purchases/Const:				
6.	Sales:				
13. TPQ	Purchased:	(kgs/day)			
14.	Sold:	(kgs/day)			
16. Credit Transfers		(\$/kg)			

### Milk Produced / Sold \*

	Litres	Total \$ Value
2. Milk Fed To Livestock		
3. Milk Used in the Home		
4. Unuseable Milk (dumped)		
5. Miscellaneous Dairy Income (i.e. colostrum sales, BSE program pmts.)		

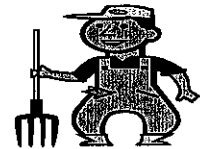
\* All Plant Sales will be recorded from Milk Statement provided by Alberta Milk

FEED Used by Dairy Herd	Office Use	Unit Type*	Bale Weight	Amount Used	Unit Price (if purchased)	Code		Office Use	Unit Type *	Amount Used	Unit Price
1 Barley						21	Dairy Ration				
2 Oats						22	Supplement				
3 Wheat						23	Brew Grain				
5 Hay (homegrown)						24	Beet Pulp				
6 Hay (purchased)						25	Alfalfa Pellets				
7 Silage						26	Calf Feed				
8 Haylage						27	Milk Replacer				
9 Greenfeed						28	Salt				
10 Straw - Fed						29	Min. & Vit.				
11 Straw-Bedding											
11 Sawdust											
12 Other:						31	Grinding & Processing				

\* T = Imperial Ton, t = Metric tonne, bu = bushels, kg = kilograms,  
ba = bales (please provide bale weight), bags (20 or 25 kg)

### LABOUR for Dairy Activities \*

LABOUR for Dairy Activities *			Total Hours	
1	Operator			
2	Wife, Partner, 2nd Operator			
3	Family Labour	16 yrs and Over		
4		Under 16		Wages & Board
5	Hired Labour	1		
5		2		



\* do not include hours doing fieldwork

### EXPENSES

EXPENSES		Total Farm (\$)	% to Dairy	% Other Farm
1	Veterinary and Medicine			
1	Breeding			
2	Livestock & Barn Supplies			
3	Building & Fence Repair			
4	Machinery & Equipment Repair			
5	Fuel, Oil, Lube (for equipment, not heating)			
13	Natural Gas			
14	Electricity			
15	Other Utilities (phone, propane, heating oil, etc.)			
7	Insurance, Licences & Taxes			
8	Cash Rental (pasture, equipment, leases, etc.)			
9	Operating Loan Interest			
10	Custom Work (i.e. manure hauling, parlour cleaning)			
11	Silage Bags (hay tarps, plastic, etc.)			
12	Misc. (legal, acct, D.H.I., hooftrimming, etc)			