

FARM FINANCIALS

DESCRIPTION

Farm Financials is a module designed to assess the financial performance of a farming enterprise. Through the use of key ratios, and the quality of life the farmer leads, this section describes the merits of monitoring financial performance of the farms. Monitoring financial performance can help farmers control their costs for managing and perhaps even growing their businesses. Appropriate business management that allows for a healthy work-life balance is also integral to a farmer's well-being and overall quality of life. Quality of life is not only influenced by personal wealth, but also by a farmer's ability to spend time with family, friends or helping the community.

According to the Farm Financial Standards Council (FFSC), there are five main areas that are used to assess the financial health and stability of a farm. These five areas can be determined by sixteen different financial ratios. For the purposes of this module, we will focus on the five ratios most commonly used by farmers and lending institutions when applying for loans.⁸⁴

| Term | Definition | Financial Ratio |
|-------------------------|--|--------------------------------------|
| 1. Liquidity | Does a farmer have the ability to pay his or her bills and interest payments on time without affecting business? | Current Ratio |
| 2. Solvency | Does a farmer have the ability to repay all his or her debt if all his or her assets were sold? In weak economic times, usually leading to an increase in debt, can a farmer continue to conduct business? | Equity to Asset Ratio |
| 3. Profitability | Does a farmer have the ability to make a profit from selling his or her goods? | Rate of Return on Farm Assets |
| 4. Repayment Capacity | Can a farmer make the payments on his or her term farm debt? | Term Debt and Capital Lease Coverage |
| 5. Financial Efficiency | Does a farmer generate the maximum amount of revenues and profits possible on his or her farm? | Operating Expense Ratio |

A farmer can assess his or her financial performance in two ways: using the cash method or an accrual accounting method. Using the cash method, a farmer calculates his or her financial position based upon his or her bank account balance. For example, if a farmer buys a tractor for \$80,000 today, he or she pays \$80,000 out of his or her bank account. While this is a dependable method for households, when it comes to businesses, the benefits of this tractor can be extended over ten years, reducing the financial burden to only \$8,000 in any single year. This ability to account for changes in inventory and supplies over time is known as the accrual method.

A balance sheet lists a farm's assets (the value of a farm's financial resources), liabilities (the financial claims of lenders, input suppliers, etc.), and equity (the owner's financial stake in the business) at a specific date in time. An income statement lists a farm's revenue and expenses over a period of time. And finally, a cash flow statement lists a farm's cash supply over a period of time.



INCENTIVES FOR CHANGE

- **Long Term Cost Reductions.** Strategic money management can allow for new capital expenditures on the farm, leading to an increase in efficiency and a long-term decrease in costs. This type of investment can span a number of areas including new barns, new tractors, tilling equipment, milk equipment, and energy saving cooling.
- **Quality of Life Improvements.** Financial planning, dual incomes, and health insurance can mitigate the pressures and stress on the average U.S. farmer. Moreover, a balanced work schedule provides the farmer and his or her family time to spend on non-farming activities, which include community involvement, time with family, vacations, and personal hobbies.

ASSESSMENT QUESTIONS

For all questions, please choose the categories that best identify your current management practices. Use the Summary sheet on the last page of this module to evaluate overall performance.

FINANCIAL STABILITY

The following ratios are used to assess financial stability and are calculated based on FFSC definitions. Sources of the financial information come from one of three places: (1) the balance sheet, (2) the income statement, or 3) the cash flow or earnings statement.

CURRENT RATIO⁸⁵ (Please fill in the following information)

| | Amount (\$) | Source |
|-------------------------------------|-------------|---------------|
| (1) Total current farm assets? | | Balance Sheet |
| (2) Total current farm liabilities? | | Balance Sheet |
| Divide (1)/(2) = | | |

PLEASE SELECT THE APPROPRIATE ANSWER BASED UPON YOUR RESULTS:

- 1. My current ratio is less than 1.
- 2. My current ratio is between 1 and 1.50.
- 3. My current ratio is greater than 1.50.

As a measurement of liquidity, the current ratio measures whether or not a farmer has the ability to pay the bills and interest payments on time without affecting business. This ratio is calculated using the following equation:

$$\text{Total current farm assets} / \text{Total current farm liabilities.}$$

Farms enjoying a competitive position generally have a current ratio of greater than 1.50 whereas farms with a current ratio of less than 1 should seek financial guidance to improve performance.⁸⁶

EQUITY TO ASSET RATIO⁸⁷ (Please fill in the following information)

| | Amount (\$) | Source |
|-------------------------------|-------------|---------------|
| (1) Total farm equity? | | Balance Sheet |
| (2) Total farm assets? | | Balance Sheet |
| Divide (1)/(2) x 100 = | | |

PLEASE SELECT THE APPROPRIATE ANSWER BASED UPON YOUR RESULTS:

- 1. My equity to asset ratio is less than 30%.
- 2. My equity to asset ratio is between 30% and 70%.
- 3. My equity to asset ratio is greater than 70%.



As a measure of solvency, the equity to asset ratio measures the proportion of total farm assets financed by the farmer's own equity (as opposed to financed by debt). This ratio is calculated using the following equation:

$$\text{Total farm equity} / \text{Total farm assets.}$$

Farms enjoying a competitive position generally have an equity to asset ratio of greater than 70% whereas farms with an equity to asset ratio of less than 30% should seek financial guidance to improve performance.⁸⁸

RATE OF RETURN ON FARM ASSETS⁸⁹ (Please fill in the following information)

| | Amount (\$) | Source |
|---|-------------|------------------|
| (1) Net income (excluding gains/losses from sale of assets) | | Income Statement |
| (2) Farm interest expense | | Income Statement |
| (3) Owner withdrawals for unpaid labor and management | | Cash Flow |
| (4) Average total farm assets | | Balance Sheet |
| (5) Calculate: (1) +(2) - (3) | | |
| Divide (5)/(4) x 100 = | | |

PLEASE SELECT THE APPROPRIATE ANSWER TO ONE OF THE FOLLOWING QUESTIONS BASED UPON YOUR RESULTS.

I own or hold a mortgage for most of my assets and:

- 1. My rate of return on farm assets is less than 1%.
- 2. My rate of return on farm assets is between 1% and 5%.
- 3. My rate of return on farm assets is greater than 5%.

I lease or rent most of my assets and:

- 1. My rate of return on farm assets is less than 3%.
- 2. My rate of return on farm assets is between 3% and 12%.
- 3. My rate of return on farm assets is greater than 12%.

Rate of Return on Farm Assets measures the amount of profit from goods sold. This metric is calculated using the following equation:

$$\text{(Net farm income from operation + Farm interest expense - Owner withdrawals for unpaid labor and management)} / \text{Average total farm assets.}$$

The “average rate of return on farm assets for farms in the US is between 3-6%”.⁹⁰ Farms (with mostly owned assets) enjoying a competitive position generally have a rate of return on farm assets ratio of greater than 5% whereas farms with a rate of return on farm assets of less than 1% should seek financial guidance to improve performance.⁹¹ Farms (with mostly leased or rented assets) enjoying a competitive position generally have a rate of return on farm assets ratio of greater than 12% whereas farms with a rate of return on farm assets of less than 3% should seek financial guidance to improve performance.⁹²



TERM DEBT & CAPITAL LEASE COVERAGE RATIO ⁹³ (Please fill in the following information)

| | Amount (\$) | Source |
|---|-------------|---------------------------------|
| (1) Net income from operations (excluding gains/losses from sale of assets) | | Cash Flow or Earnings Statement |
| (2) Total miscellaneous revenue (if not included in net income from operations) | | Cash Flow or Earnings Statement |
| (3) Total miscellaneous expense (if not included in net income from operations) | | Cash Flow or Earnings Statement |
| (4) Total non farm income | | Cash Flow or Earnings Statement |
| (5) Depreciation/amortization expense | | Cash Flow or Earnings Statement |
| (6) Interest on term debt | | Cash Flow or Earnings Statement |
| (7) Interest on capital leases | | Cash Flow or Earnings Statement |
| (8) Total income tax expense | | Cash Flow or Earnings Statement |
| (9) Total owner withdrawals | | Cash Flow or Earnings Statement |
| (10) Annual scheduled principal and interest payments on term debt | | Cash Flow or Earnings Statement |
| (11) Annual scheduled principal and interest payments on capital leases | | Cash Flow or Earnings Statement |
| (12) Calculate: (1) +(2) - (3) +(4) +(5) +(6) +(7) -(8) -(9) | | |
| (13) Calculate: (10) + (11) | | |
| Divide: (12)/(13) = | | |

PLEASE SELECT THE APPROPRIATE ANSWER BASED UPON YOUR RESULTS:

- 1. My term debt & capital lease ratio is less than 110%.
- 2. My term debt & capital lease ratio is between 110% and 150%.
- 3. My term debt & capital lease ratio is greater than 150%.

Better known as Repayment Capacity, this ratio measures whether or not a farmer can repay term farm debt. This metric is calculated using the following equation:

(Net farm income from operations +/- total miscellaneous revenue/expense + total non-farm income + depreciation/amortization expense + interest on term debt + interest on capital leases – total income tax expense – owner withdrawals (total))/ (Annual scheduled principal and interest payments on term debt + annual scheduled principal and interest payments on capital leases).

Farms enjoying a competitive position generally have a term debt and capital lease ratio of greater than 150% whereas farms with a term debt and capital lease ratio of less than 110% should seek financial guidance to improve performance.⁹⁴



OPERATING EXPENSE RATIO⁹⁵ (Please fill in the following information)

| | Amount (\$) | Source |
|---|-------------|------------------|
| (1) Total Operating Expenses | | Income Statement |
| (2) Depreciation and Amortization Expense plus interest | | Income Statement |
| (3) Revenues | | Income Statement |
| (4) Calculate: (1) – (2) | | Income Statement |
| Divide: (4)/(3) = | | |

PLEASE SELECT THE APPROPRIATE ANSWER TO ONE OF THE FOLLOWING QUESTIONS BASED UPON YOUR RESULTS.

I own or hold the mortgage on most of my assets and:

- 1. My operating expense ratio is greater than 80%.
- 2. My operating expense ratio is greater than 65% but less than 80%.
- 3. My operating expense ratio is less than 65%.

I lease or rent most of my assets and:

- 1. My operating expense ratio is greater than 85%.
- 2. My operating expense ratio is greater than 75% but less than 85%.
- 3. My operating expense ratio is less than 75%.

This ratio measures whether a farmer generates the maximum amount of revenues and profits possible from the farm. This metric is calculated using the following equation:

$$\text{(Total operating expenses – depreciation and amortization expense) / Revenues.}$$

"A benchmark for the operating expense ratio is between 65-80%—a ratio over 80% often indicates profitability problems, while less than 65% indicates great efficiency."⁹⁶ Farms (with mostly owned assets) enjoying a competitive position generally have an operating expense ratio of less than 65% whereas farms with an operating expense ratio of greater than 80% should seek financial guidance to improve performance.⁹⁷ Farms (with mostly leased or rented assets) enjoying a competitive position generally have an operating expense ratio of less than 75% whereas farms with a ratio of greater than 85% should seek financial guidance to improve performance.⁹⁸

FARM INCOME (Fill in the chart below and answer the following question)

| Gross | Income (\$) | Off Farm |
|---|-------------|----------|
| My Income | | |
| Spouse's Income | | |
| Other Income | | |
| Total Income | | |
| My Income/ Total Income (%) | | |
| Spouse's Income/Total Income (%) | | |

OUR FAMILY'S INCOME IS SUFFICIENT FOR PAYING FOR (Please check all that apply):

- Food
- Clothing
- Mortgage and monthly bills
- Health insurance
- A savings account



Milk price fluctuations have contributed greatly to the rise in off-the-farm family income. Additional income can provide several benefits such as: 1) offsetting low farm returns; 2) providing for basic necessities such as health insurance and maintenance of the farm; and 3) possibly raising living standards and protecting against fluctuations in farm income. In recent years, almost 60% of US Farm households had either the farmer, spouse, or both employed in off-farm work.⁹⁹ Moreover, approximately 80% had higher cash incomes from off-farm earnings (including wages, rent, interest) than from farming operations.¹⁰⁰

WORK/LIFE BALANCE (Please fill in the following information and answer the following question)

| | MON | TUES | WED | THURS | FRI | SAT | SUN | Total Hours |
|---|-----|------|-----|-------|-----|-----|-----|-------------|
| Number of hours working on farm | | | | | | | | |
| Number of hours spent with family | | | | | | | | |
| Number of hours spent on leisure activities | | | | | | | | |
| Total Hours | | | | | | | | |

PLEASE CHECK ALL THAT APPLY:

- I work more than 70 hours/week on the farm.
- I spend more than 10 hours/week with my family each week.
- I spend more than 5 hours/week on leisure activities such as hunting, snow mobiling, volunteering, etc.
- I have taken a vacation in the past year with my family.

A farmer must consider his or her financial stability in relation to his or her work/life balance. While the appropriate amount of time to spend with family is based upon individual preference, the general consensus is that the more “family time” a person can accumulate, the happier he or she will be. The response from farmers is overwhelmingly that spending time with children is an esteemed goal and influences a farmer's participation in farming practices that lead to a reduction of labor time required on the farm.¹⁰¹

ATTITUDE TOWARDS ADOPTING NEW PRACTICES

- 1. New farming practices are costly and risky. Therefore I have not considered them in a while.
- 2. I would like to implement new farming techniques and have done a lot of reading on different options; however, based on completed financial evaluation, money is a constraint.
- 3. I am very open to new farming technology and seek out new information. When a new technology makes sense for my farm, I implement it.

PLANNING FOR THE FUTURE (Check all that apply.)¹⁰²

- I am not involved with the future planning of the farm; decisions are made by my family.
- I am in the process of improving the current conditions of the barn for the cows.
- I want to increase the number of cows on the farm.
- I am considering additional crops on the farm to diversify sources of income.
- I have a plan for when milk prices fluctuate greatly.
- I am constantly looking for ways to save money on the farm.



To increase the stability of his or her enterprise, a farmer should investigate new practices and complete business plans, similar to any other business. According to ATTRA, farm planning and production goals are on-going processes that require farm families to define a goal as well as a path to achieve those goals.¹⁰³ Research indicates that simply by taking the time to consider long term business planning can be motivation enough to affect change.¹⁰⁴ These actions are increasingly important given current low milk prices. Since 1960, Vermont has lost over 80% of its dairy farms primarily due to changing prices of milk and competing uses for land and labor.¹⁰⁵ While production per cow has risen steadily, farmers' profits have been squeezed, since the costs of producing milk have increased at a substantially faster rate than the price of milk.¹⁰⁶ Therefore business planning must account for rapid changes in order to ensure a farmer's success.

LINKAGES TO OTHER MODULES

While the questions above cover some of the basics regarding financial and quality of life management, other practices also impact farm financials. Please review your practices regarding the following topics in the Educational Modules listed below.

| FARM FINANCIAL TOPIC | OTHER MODULE(S) |
|----------------------|------------------|
| Term Debt | Energy |
| Quality of Life | Community Health |

FURTHER INFORMATION

Additional details and information on the above can be obtained through the following programs or sources.

- **Center for Farm Financial Management, University of Minnesota.** <http://www.cffm.umn.edu/>. This website provides information on financial and business planning.
- **Doehring, Todd A.** "Analyzing the Efficiency of Your Operation," AEC, 2001 <http://www.centrec.com/resources/Articles/FinAnalysisFarmRanches/Efficiency.pdf>. This document walks through how to calculate and measure each FFSC metric for efficiency.
- **Doehring, Todd A.** "Analyzing the Profitability of Your Operation," AEC, 2001 <http://www.centrec.com/resources/Articles/FinAnalysisFarmRanches/Profitability.pdf>. This document walks through how to calculate and measure each FFSC metric for profitability.
- **Pennsylvania State University.** "Green Milk Successfully Test-Marketed at Mid-Atlantic Stores." <http://aginfo.psu.edu/news/may00/greenmilk.html>. This article describes a program which pays farmers a premium if they produce milk using environmentally friendly management practices. The program, called the Environmental Quality Initiative Inc., is a joint venture of the Chesapeake Bay Foundation, Pennsylvania State University, the Rodale Institute, the Pennsylvania Association for Sustainable Agriculture and the US EPA. The program pays farmers a five-cent premium per half gallon to encourage participation and offset any costs incurred due to changes in management practices.
- **Purdue University Cooperative Extension Service.** "Farm Business Management for the 21st Century. Measuring and Analyzing Farm Financial Performance." <http://www.agecon.purdue.edu/extension/programs/fbm21/EC712entry.htm> This site provides additional measures for farm financial performance including cash flow analysis, debt service analysis, and information on how to respond to financial difficulty.
- **Virginia Cooperative Extension Service.** <http://www.ext.vt.edu/resources/>. This page includes information on a variety of topics related to farm financials. Sections of interest include Financial Management and Farm Business Management and Marketing. These sections cover specific financial topics such as estate planning, equipment leasing economics, and much more.
- **Farm Management Specialist, UVM Extension.** Information on farm financials and management. Burlington, VT 05405-0106 Phone: 802-656-2109 <http://www.uvm.edu/extension>



- **Kohl, David.** Summary of Key Ratios and Benchmarks. Not dated. This table developed by David Kohl and shown on the following page summarizes additional key financial ratios, their calculations, and corresponding benchmarks for the agriculture industry. It includes fifteen of the sixteen farm financial ratios advocated by the FFSC plus one additional ratio. This additional ratio, the California Working Capital Rate, is used to calculate liquidity.

| Summary of Key Ratio Calculations and Benchmarks | | | | |
|--|--|--|---------------|------------|
| Repayment Analysis | Calculation | Green | Yellow | Red |
| Term Debt and Lease Coverage Ratio | $[(\text{NFIFO}^* + \text{Gross Non-Farm Revenue} + \text{Depreciation Expense} + \text{Interest on Term Debts and Capital Leases}) - \text{Income Tax Expense} - \text{Family Living Withdrawals}] / \text{Scheduled Annual Principal and Interest Payments on Term Debt and Capital Leases}$ | >150% | 110% to 150% | <110% |
| Debt Payment / Income Ratio** | $\text{Scheduled Annual Principal and Interest Payments on Term Debt and Capital Leases} / (\text{NFIFO}^* + \text{Gross Non-Farm Revenue} + \text{Depreciation Expense} + \text{Interest on Term Debts and Capital Leases})$ | <25% | 25% to 50% | >50% |
| Liquidity Analysis | | | | |
| Current Ratio | $\text{Total Current Farm Assets} / \text{Total Current Farm Liabilities}$ | > 1.50 | 1.00 to 1.50 | < 1.00 |
| Working Capital | $\text{Total Current Farm Assets} - \text{Total Current Farm Liabilities}$ | compare to business expenses, absolute amount depends on scope of operation | | |
| California Working Capital Rule** | $\text{Working Capital} / \text{Total Expenses}$ | > 50% | 20% to 50% | <20% |
| Solvency Analysis | | | | |
| Debt / Asset Ratio | $\text{Total Farm Liabilities} / \text{Total Farm Assets}$ | <30% | 30% to 70% | >70% |
| Equity / Asset Ratio | $\text{Total Farm Equity} / \text{Total Farm Assets}$ | >70% | 30% to 70% | <30% |
| Debt / Equity Ratio | $\text{Total Farm Liabilities} / \text{Total Farm Equity}$ | <42% | 42% to 230% | >230% |
| Profitability Analysis | | | | |
| Rate of Return on Farm Assets (ROA) (mostly owned) | $(\text{NFIFO}^* + \text{Farm Interest Expense} - \text{Operator Management Fee}) / \text{Average Total Farm Assets}$ | >5% | 1% to 5% | <1% |
| Rate of Return on Farm Assets (ROA) (mostly rented / leased) | $(\text{NFIFO}^* + \text{Farm Interest Expense} - \text{Operator Management Fee}) / \text{Average Total Farm Assets}$ | >12% | 3% to 12% | <3% |
| Rate of Return on Farm Equity (ROE) | $(\text{NFIFO}^* - \text{Operator Management Fee}) / \text{Average Total Farm Equity}$ | look at trends and compare to other farm and non-farm investments | | |
| Operating Profit Margin Ratio | $(\text{NFIFO}^* + \text{Farm Interest Expense} - \text{Operator Management Fee}) / \text{Gross Revenue}$ | >25% | 10% to 25% | <10% |
| Financial Efficiency | | | | |
| Asset Turnover Ratio | $\text{Gross Revenue} / \text{Average Total Farm Assets}$ | depends heavily on type of operation and whether it is owned / leased | | |
| Operating Expense / Revenue Ratio (mostly owned) | $\text{Operating Expenses [excluding interest and depreciation]} / \text{Gross Revenue}$ | <65% | 65% to 80% | >80% |
| Operating Expense / Revenue Ratio (mostly rented / leased) | $\text{Operating Expenses [excluding interest and depreciation]} / \text{Gross Revenue}$ | <75% | 75% to 85% | >85% |
| Depreciation Expense Ratio | $\text{Depreciation Expense} / \text{Gross Revenue}$ | compare to capital replacement and term debt repayment margin | | |
| Interest Expense Ratio | $\text{Interest Expense} / \text{Gross Revenue}$ | <12% | 12% to 20% | >20% |
| Net Farm Income From Operations Ratio | $\text{NFIFO}^* / \text{Gross Revenue}$ | look at trends, varies due to cyclical nature of agricultural prices and incomes | | |
| * NFIFO = Net Farm Income From Operations excluding gains or losses from the disposal of farm capital assets | | | | |
| ** Not a ratio recommended by the Farm Financial Standards Taskforce and Council, but widely used | | | | |



SUMMARY RESULTS FOR FARM FINANCIALS AND QUALITY OF LIFE

Instructions: In the table below, please record the score for the answer you selected for each question. For multiple-choice questions, the response number serves as your score for that category (i.e. choice # 2 is worth 2 points). For “check all that apply questions,” please see scoring criteria for each question in the chart below. Once all responses have been completed, add up the answers and record the total.

| QUESTION | ANSWER/SCORE |
|---|--------------|
| 1. Current Ratio | |
| 2. Equity to Asset Ratio | |
| 3. Rate of Return on Farm Assets | |
| 4. Term Debt & Capital Lease Coverage Ratio | |
| 5. Operating Expense Ratio | |
| 6. Farm Income (Add 1 for each box checked) | |
| 7. Work/Life Balance (Add 1 for each box checked) | |
| 8. Attitude Towards Adopting New Practices | |
| 9. Planning for the Future (Add 1 for each box checked) | |
| Total Score (Out of Possible 33) | |

Interpretation: The next step in understanding your farm's performance in the category of Farm Financials and Quality of Life Module is to compare the results to best practices. Below is a table that ranks your performance from best practice (green) to practices that require improvement (red). Compare the number of points you received for your farm to optimal practices.

| | Point Range | Interpretation |
|---------------|-------------|--|
| Green | 28 - 33 | Best practices regarding Farm Financials are currently being employed on this farm. |
| Yellow | 20 - 27 | Farm is using some good practices regarding Farm Financials; however there are some key areas that should be improved on. |
| Red | 6 - 19 | Farm Financials should be carefully evaluated and a strong effort should be made to adopt improved practices in several areas. |



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Footnotes

- 84 Kohl, David. "RE: Research on Sustainability of Dairy Farming for Ben and Jerry's Ice Cream." E-mail to Mindy Murch. 7 July 2003.
- 85 This question is based on ratios described in (1) Farm Financial Standards Council. Financial Guidelines for Agricultural Producers. Revised, December 1997; and (2) Kohl, David. Summary of Key Ratios and Benchmarks. Not dated.
- 86 Ibid.
- 87 Ibid.
- 88 Kohl, David. Summary of Key Ratios and Benchmarks. Not dated.
- 89 This question based on ratios described by (1) Farm Financial Standards Council. Financial Guidelines for Agricultural Producers. Revised, December 1997 and (2) Kohl, David. Summary of Key Ratios and Benchmarks. Not dated.
- 90 Doehring, Todd A. Analyzing the Profitability of Your Operation, AEC, 2001. 19 Nov. 2003
<<http://www.centrec.com/resources/Articles/FinAnalysisFarmRanches/Profitability.pdf>>.
- 91 Kohl, David. Summary of Key Ratios and Benchmarks. Not dated.
- 92 Ibid.
- 93 This question is based on ratios described in (1) Farm Financial Standards Council. Financial Guidelines for Agricultural Producers. Revised, December 1997; and (2) Kohl, David. Summary of Key Ratios and Benchmarks. Not dated.
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- 96 Doehring, Todd A. Analyzing the Efficiency of Your Operation, AEC, 2001. 19 Nov. 2003
<<http://www.centrec.com/resources/Articles/FinAnalysisFarmRanches/Efficiency.pdf>>.
- 97 Kohl, David. Summary of Key Ratios and Benchmarks. Not dated.
- 98 Ibid.
- 99 Weersink, A., et al. "Multiple Job Holdings Among Dairy Farm Families in New York and Ontario." Agricultural Economics 18. 1998.
- 100 Ibid.
- 101 Kroma, Margaret M. and Cornelia Butler Flora. 2001. "An Assessment of SARE-funded Farmer Research on Sustainable Agriculture in the North Central U.S." American Journal of Alternative Agriculture. 16 (2): 73-80. 7 Dec. 2003
<<http://www.ag.iastate.edu/centers/rdev/pubs/flora/asses-sare.htm>>.
- 102 Wells, Anne and Morrow, Ron. "Dairy Farm Sustainability Checklist." ATTRA, March, 2001.
- 103 Ibid.
- 104 Ibid.
- 105 Pelsue, Neil, and Woodruff, Katie. "Agriculture, Food, and Community in Vermont." The University of Vermont Extension. July, 1996. 7 Dec. 2003<<http://www.uvm.edu/extension/publications/factsheets/agfs2/>>.
- 106 Ibid.

