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# ***Staff Paper***

## **Dairy Farmers' Use of Financial Long-range Planning (FINLRB) to Aid Decision-Making**

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**DAIRY FARMERS' USE OF FINANCIAL LONG-RANGE PLANNING (FINLRB) TO AID  
DECISION-MAKING**

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**Introduction**

The dairy business is capital intense and farmers planning substantial financial or managerial change can be aided by detailed financial information. The FINPACK<sup>TM</sup> computer software program (Center for Farm Financial Management, University of Minnesota) is a comprehensive financial analysis and planning system. The program utilizes personalized balance sheets, revenue and expense detail, and enterprise budgets to construct accrual financial statements. Statement construction is based on principles outlined by the Farm Financial Standards Council (1997). FINPACK<sup>TM</sup> can generate a financial analysis of the past year (FINAN), a long-range projection of profit potential (FINLRB), or a detailed cash flow (FINFLO).

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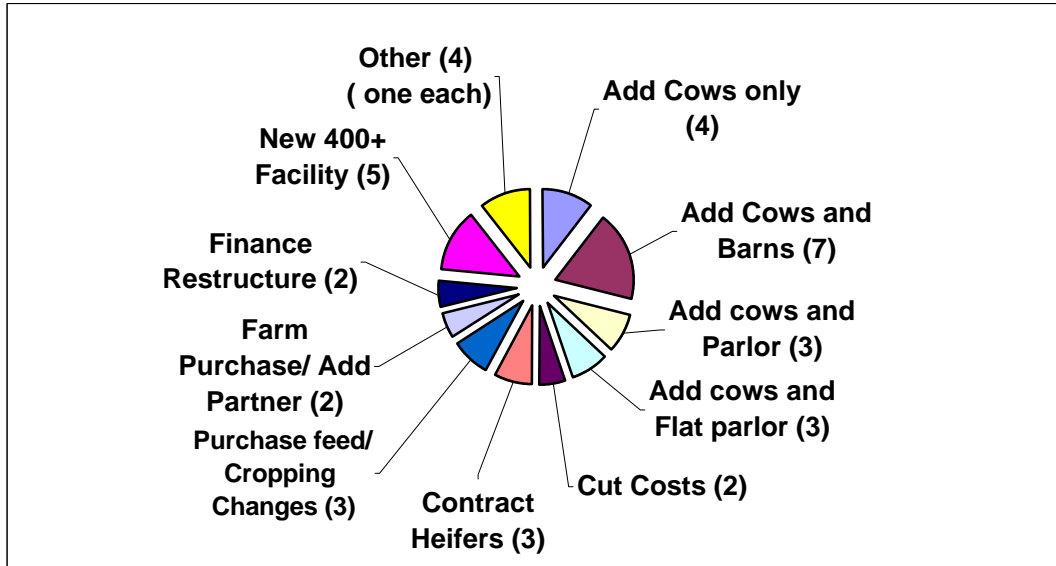
Michigan State University Extension has used the FINAN (financial analysis) portion of FINPACK to perform annual farm business analyses for seven years. The FINAN utilizes beginning and ending year balance sheets as well as income and expense information to generate an accrual income statement (profit and loss statement). In contrast, the **FINLRB** (financial long-range planning) portion of FINPACK is used to project the profit and cash flows of alternative future scenarios. A FINLRB exercise is commonly used to determine if proposed farm expansions will cash flow or be profitable on an annual basis. Utilizing farm level enterprise budgets and balance sheets, the software can build multiple alternative scenarios.

The objectives of this study were twofold: 1) identification of investment and financial factors that had large impacts on the accuracy of projections, and 2) to assess farmers' satisfaction with financial long-range planning output.

## **Methods**

Using Extension resources, 102 dairy farmers in 13 southwest Michigan counties and 12 dairy farmers in six Minnesota counties were contacted for permission to use their electronic FINPACK<sup>TM</sup> files and for a visit to administer a survey instrument. The same investigator conducted all farm visits between February and July 2000. The agent that conducted the original FINLRB was not present. The investigator administered the survey verbally and recorded responses. Data from the electronic files and from the survey were compiled in an Excel spreadsheet for summation and analysis. The survey can be found in Appendix 1. The FINLRB

portion of each farm's file was compared with actual investments as reported on tax depreciation schedules to determine the accuracy of the projections



**Figure 1.** Descriptions of the selected FINLRB alternatives for 38 Michigan

Sixteen of the Michigan farms also completed a FINAN after they proceeded with the proposed change modeled by their FINLRB. For these farms, actual herd size, milk production, net farm income (NFI), milk revenue, and feed, labor and total cash expenses were collected from FINANs and compared to projected numbers from the FINLRB.

## Results

### *Objective 1a. Investment Factors*

Electronic FINPACK<sup>TM</sup> files were collected from and the survey was administered to 38 dairy farmers - 29 from Michigan and nine from Minnesota. Thirty-one of the 38 farms completed investments at the time of the study, allowing comparison of actual investments with FINLRB

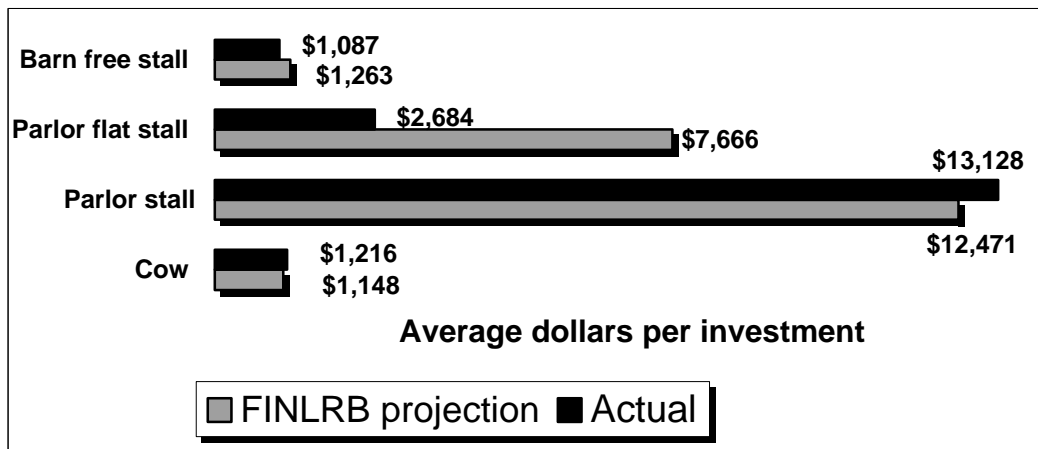
projections. FINLRB projections from these 31 farms were completed between October 1992 and March 2000. Farmers used FINLRB to evaluate a wide range of alternative investments from simply purchasing cattle to considering the addition of a business partner to building complete, new facilities (Figure 1).

Farms reported actual investments totaling \$12,802,161 for an average investment of \$412,973 per farm. Cattle (\$5,361,075) and barns (\$4,234,674) represented the largest expenditures and accounted for 75% of total actual investments. Parlor expenditures totaled \$2,196,320 and represented another 17% of total actual investments. Several of the expansions were renovations or additions of existing facilities or construction of flat parlors. Feed equipment like total mixed ration (TMR) mixers, and field investments like choppers represented only 3 and 2% of total actual dollars invested, respectively, but were often not included in projected investments. Facilities and equipment to handle manure represented 3% of total actual investments at \$390,530.

The FINLRB projections of added capital items (Row M on FINLRB output) totaled \$10,567,634 for 27 farms (four of the 31 farms planned no investments in their projection). The difference of \$2,234,527 between the actual investments and the projected investments averaged \$82,760 per farm. On average, farms spent 21% more than projected. Components of the projects that were identified at the time of the survey as underestimated totaled \$755,250 on ten farms and averaged \$75,525 per farm. Concrete and excavating costs, parlor and barn changes, and sufficient bunker silo capacity were listed. Cow numbers and prices, and farm labor were other underestimated items mentioned during the survey.

Eight farms identified components of the projects that were overestimated including barn construction not elected or completed at a lower amount. Reduced cow purchases when dairies grew from within and cow purchase price when whole herds were purchased were other areas of overestimation in the projections.

One way to assess investment numbers is to evaluate average investment per stall or per cow (Figure 2). Farms' actual investments averaged \$1,087 per barn free stall and \$1,216 per cow purchased (primarily late pregnant heifers). Actual parlor investments (*parlor building and equipment*) averaged \$13,128 per parlor stall on 11 farms. Most parlors had take-off automation



**Figure 2.** Actual vs. projected investments for 31 Michigan and Minnesota dairy farms, 1995-2000.

and several included computer identification and sort gates. The investments in flat barns or step-up parlors involved renovations to existing barn shells and averaged \$2,684 per stall on four farms. Heifer prices increased significantly, by \$300 per heifer on some farms, during the latter

part of the study period. Because of this elevation, several farms purchased fewer replacement cattle than projected.

***Objective 1b. Financial Factors*** Sixteen southwest Michigan dairy farmers completed FINANs for the year following facility completion (Yr +1) and 13 had complete FINANs two years following facility completion (Yr +2). This allowed comparison of actual herd size, milk production, NFI, milk revenue, and feed, labor and total cash expenses of the FINLRB projection with the actual values found in the FINAN. These values are found in Tables 1 and 2.

For both years following facility completion average cow numbers and income factors met or exceeded projection in the FINLRB. However, average feed, labor, and total costs were greater than projected. These costs were the larger factors contributing to the farms not meeting the NFI projection.



**Table 1.** Comparison of production, revenue and expense factors from 16 Michigan dairy farms' FINLRB projections and actual FINANs 1 year after facility completion.

	<b>PROJECTED</b>	<b>ACTUAL</b>
	<b>Mean FINLRB Projections</b>	<b>Mean FINANs Yr +1</b>
	<b>n = 16</b>	<b>n = 16</b>
Milking and Dry Cows	379	375
Milk Sold per Cow	20,363	20,671
Gross Milk Price per Cwt	\$13.35	\$14.39
Milk Revenue	\$1,000,255	\$1,167,888
Purchased Feed Cost	\$308,070	\$326,374
Hired Labor	\$156,993	\$190,353
Total Cash Expenses	\$1,003,374	\$1,097,572
Net Farm Income	\$197,830	\$124,090
Milk Revenue per Cow	\$2,603	\$2,961
Purchased Feed Cost per Cow	\$773	\$824
Hired Labor per Cow	\$393	\$478
Total Cash Expenses per Cow	\$2,675	\$2,853
Net Farm Income per Cow	\$493	\$343

**Table 2.** Comparison of production, revenue and expense factors from 13 Michigan dairy farms' FINLRB projections and actual FINANs 2 years after facility completion.

	<b>PROJECTED</b>	<b>ACTUAL</b>
	<b>Mean FINLRB Projections</b>	<b>Mean FINANs Yr +2</b>
	<b>n = 13</b>	<b>n = 13</b>
Milking and Dry Cows	304	340
Milk Sold per Cow	19,715	19,718
Gross Milk Price per Cwt	\$13.43	\$14.63
Milk Revenue	\$743,106	\$986,275
Purchased Feed Cost	\$247,142	\$284,914
Hired Labor	\$110,587	\$159,624
Total Cash Expenses	\$809,860	\$1,003,546
Net Farm Income	\$105,328	\$65,107
Milk Revenue per Cow	\$2,522	\$2,866
Purchased Feed Cost per Cow	\$773	\$759
Hired Labor per Cow	\$359	\$453
Total Cash Expenses per Cow	\$2,655	\$2837
Net Farm Income per Cow	\$425	\$368

Only 25% of the 16 farms had higher actual NFI in Yr +1 compared to NFI projected by the FINLRB (Table 3). During Yr +1, four of the farms had negative NFI. This low actual NFI occurred despite a higher than projected milk price (median + \$0.63/cwt). Cow numbers exceeded projection on 67% of the farms and 69% of the farms exceeded milk production per

cow goals. However, 81% of the farms exceeded projected labor costs and 50% exceeded projected feed costs in Yr +1.

**Table 3.** Percent of farms that had higher values in Yr +1 and Yr+2 compared to the projected FINLRB.

	<b>Yr +1</b>	<b>Yr +2</b>
Milking and Dry Cows	62%	69%
Milk Sold per Cow	69%	54%
Gross Milk Price per Cwt	75%	77%
Milk Revenue	81%	92%
Purchased Feed Cost	50%	70%
Hired Labor	81%	92%
Total Cash Expenses	69%	77%
Net Farm Income	25%	54%
Number of Farms	16	13

Two years after facility completion, 54% of the 13 farms with completed FINANs had a NFI higher than that in the FINLRB projection. Labor and feed costs were again the major contributors to higher than projected total cash expense. However, 92% of the farms exceeded the milk revenue projection, which allowed twice the amount of farms to met NFI goals as the previous year.

## *Objective 2. Farmers' Satisfaction*

All 38 personal survey results were utilized for the assessment of the FINLRB tool and Extension technical expertise. Ten Extension agents from the two states conducted the FINLRB projections.

It was not surprising that nearly all of the dairy farmers (36 of 38) knew of the FINLRB program through their contact with Extension, as this was the source of the files for this project. The remaining two was referred from lenders. Over half of the farms characterized the run as a "What If" projection considering multiple enterprises, cropping and livestock numbers, and investments. Twenty-six percent were "initial runs," many times with limited preparation in data generation. Sixteen percent had compiled actual bids on investments before conducting the FINLRB. One farm wrote checks to contractors for the same figures entered into the FINLRB.

Ten of the 38 farms chose **not** to invest in an enterprise based on review of the FINLRB data. This decision not to proceed is at least as important to the farm families as the decision to proceed with making major investments.

The median milk price selected by the dairy farmers and Extension agents was \$13.00, but ranged from \$11.50 to \$16.43. The wide fluctuations in the milk prices during the study period and the current price at the time of the FINLRB had an impact on the milk price chosen. Many dairy farmers commented on the significant impact milk price had on the projection and often chose a conservative milk price.

The farmers were asked two groups of questions about the usefulness and quality of the FINLRB tool in their decisions. Eighty-two percent of the farmers found the FINLRB tool “very” or “extremely” useful in meeting the owner’s need for the project viability (Table 4). Also, over 50% of the farms found the tool “very” or “extremely” useful in estimating cow numbers needed and in meeting the lenders’ requests. However, 32% of the farms used it “little” for lenders’ requests. Some of these projects were self-funded. Seventy-five percent of the farms reported the tool “some” or “very” useful in compiling projected investment numbers.

**Table 4.** How useful was the FINLRB in the following decisions? Percent of responses from 38 Michigan and Minnesota dairy farmers.

	Little	Some	Very	Extremely
Estimating cow numbers needed?	24%	21%	47%	8%
Compiling projected investment numbers?	19%	43%	32%	5%
Meeting lenders requests?	35%	11%	24%	30%
Meeting owner’s need of project viability?	3%	16%	66%	16%

The vast majority of the farmers rated the quality of the FINLRB tool as “very” or “extremely” good (Table 5). Sixty-eight percent rated the overall usefulness “very good” while 82% found the clarity of the output “very good”. Sixty-three percent reported the time requirement as “little” or “some”, while 37% felt it required a “very” or “extremely” large amount of time. The program was found to be “very” or “extremely” available by 91% of the farmers. Most projections take several hours and sometimes multiple visits to complete. However, the farmers did not view this

as an extremely large time requirement. Most were equally divided between “little,” “some” and “very” on the amount of time requirement.

**Table 5.** What is your assessment of the quality of the FINLRB tool? Percent of responses from 38 Michigan and Minnesota dairy farmers.

	Little	Some	Very	Extremely
Ease of use	5%	32%	55%	8%
Clarity of output/results	0%	11%	82%	8%
Assisted in lender decision	19%	35%	23%	32%
Availability of FINLRB	0%	8%	74%	18%
Time requirement	26%	37%	26%	11%
Overall usefulness	0%	16%	68%	16%

Dairy farmers were asked to identify compounding problems encountered in the expansion phase. Management change was listed as a “minor” or “some” problem by 75% of the farms and a “major” problem on only 6% of the farms (Table 6). In addition, it was reported only half as many times as “none” compared to the other six potential problems. The other six potential problem areas: cow health/biosecurity, milk production per cow, feed shortage, manure issues, labor needs, and replacements were listed as “none” by 39 to 64% of respondents. Labor needs were listed as “none” and “minor” by 75 % of the farms. Thirty-one percent or more of the farms listed “some” or “major” problems with cow health/biosecurity, management change, and replacements. High culling rates were cited with purchased cattle on some farms. The number of replacements required when purchasing late pregnant heifers was also sometimes underestimated.

**Table 6.** What compounding problems did you encounter in the expansion phase?

Percent of responses from 38 Michigan and Minnesota dairy farms.

	None	Minor	Some	Major
Cow health /biosecurity	47%	19%	22%	11%
Labor needs	39%	36%	11%	14%
Management change	19%	39%	36%	6%
Milk production per cow	56%	17%	22%	6%
Feed shortage	64%	14%	14%	8%
Manure issues	47%	25%	19%	8%
Replacements	42%	28%	14%	17%

***Extension personnel role and farmer recommendations***

The 38 dairy producers felt very comfortable in sharing detailed financial information with the Extension agent. The quality of the technical assistance of the Extension personnel conducting the FINLRB was reported “very” or “extremely” good by 36 of the 38 farmers. All farmers would recommend the program to their neighbors. When asked how much they would pay for these FINLRB results, many calculated an hourly rate of a comparable consultant or accountant, or related it to the cost of the producer version of FINPACK™ software. These responses varied from \$90 to \$5,000 with an average of \$750. Answers were somewhat dependent on the size of the project.

The farmers provided many favorable comments about both the FINLRB tool and the person conducting the financial projection. Some questioned the quality of input data gathered, while others addressed the need to review the results in greater detail. Several producers indicated that the FINLRB projection led to use of consultants to fine-tune the financial project, or they utilized the program with their lender. A few wished the agent would slow down so they could better grasp all the information. The challenge of projecting milk and cattle prices was again mentioned. Several farmers mentioned the value of a neutral third party, often offered by Extension, between buyer and seller. They also acknowledged the need for someone who understands dairy management as well as the computer software program and could recognize faulty budget information.

### **Discussion**

It is not unusual for farmers to spend more on new investments than initially planned. Differences between actual and projected investments varied widely from farm to farm. Much of the difference occurred because actual investments did not follow those planned in the projection. A frequent farmer response was “we selected a combination of two alternatives.” For example, one farm spent \$2,854,270 more than estimated in an initial FINLRB projection. Another spent \$2,149,000 less when they built a flat barn parlor instead of the planned complete new facility. Others saved money when they built higher density barns than projected or purchased fewer cattle and grew the herd from within. Cows were purchased at under projected prices on a few farms when complete herds were purchased rather than heifers. On many farms, purchased heifer costs were significantly higher than projected. Some farms constructed facilities with family and farm labor, which saved investment costs.



NFI projections were not met on the majority of the farms with completed FINANs in Yr +1. Only slightly better than half were able to meet this projection two years after facility completion. Purchased feed and labor expenses were the primary reasons these farms did not reach NFI projections.

The FINLRB is intended to be a long-range decision making tool. Start up costs of projects and unexpected market price changes are hard to project accurately. In fact, a FINLRB is designed to compare alternative scenarios at some point in the future when they have reached stability – when the uncertainty of expansion transition has ended. When an individual farm reaches that point is unique and difficult to determine. It was not established that the farms studied in this project had reached that time of stability when the FINANs of Yr +1 and +2 were collected. Therefore, it may be quite unfair to compare the FINLRB projections to any one or all of the FINANs collected. However, lessons can be gleaned from the comparisons of actual and projected production, revenue, and expense data.

1. 60-70% of farms reached projected cow numbers immediately after facility completion.
2. 55-70% of farms reached projected milk production immediately after facility completion.
3. Despite very careful attention to details, 50-70% of the farms underestimated purchased feed costs.
4. On 80-90% of the farms, hired labor costs were underestimated.

It appears that farms do fairly well in filling barns and making milk in their expansions. However, producers (and Extension agents) are much too optimistic about farms' ability to control feed and labor costs. Careful examination of all farm records reveals no repeating reasons for the underestimation of these costs. Each farm faced different circumstances. Examples of higher feed costs include internal transfers for new partnerships, different acres farmed than in the projection, feed inventories increased, and drought in the expansion year.

A FINFLO, which projects detailed monthly cash flow over several years, may provide farmers with more complete and accurate financial projections over the time of a new construction project. The FINLRB did meet the majority of farmers needs by assisting in development of a strategic direction for the business. The authors believe that the process of generating the FINLRB, from data generation to alternative selection to output review, is as important as the final financial "answer" provided.

## **Conclusions**

The farms surveyed invested \$2,234,527 more than projected in the FINLRB - an additional 21%. Excavating, concrete, and farm building labor were often underestimated or omitted, and should be more carefully projected. Cattle prices and replacement numbers were also commonly underestimated. Many other differences in projected and actual investments were due to changes chosen by farmers between time of initial FINLRB and final investment decisions. A majority of Michigan farms that completed FINANs had a difficult time reaching the projected net farm income one year after facility completion. These farms failed to reach projections even though cow numbers, milk prices, milk production, and milk revenue were greater than projected.

Actual labor and feed costs were higher than projected for these farms and contributed to the less than projected NFI.

A major goal of the study was to identify items that could lead Extension agents to conduct a more accurate and meaningful financial projection. Running additional alternatives could reduce many of the above-mentioned problems. Running a FINFLO (cash flow) may also offer farmers a more accurate financial picture over time of a building project. Major farm expenses of labor and purchased feed should be carefully estimated, as they appear to have the largest negative impact on projected NFI.

The FINLRB tool was rated very favorably in assisting the decision-making process and overall usefulness. The farmers valued the results at an average of \$750 per FINLRB. Both agents and farmers recognized the importance of good data for input. The quality of the farms' record keeping and the retrieval of that information by categories that match the FINPACK format are main determinates of accuracy of input data and therefore, output. The speed of data input also impacts the time available to review and refine output. Proper time to study and evaluate the results should be planned to reduce errors and better model the final project.

### **Acknowledgements**

First, we wish to thank the dairy farmers that took time from their busy schedules, allowed an interview and shared financial data for this study. It was enjoyable to visit farms, meet the families and view new facilities. Special thanks to the Extension agents that performed the

FINLRBs, shared files and assisted in farm interviews in Michigan and Minnesota. Also, thanks to Dr. Murari Survedi, Department of Education and Communication Systems, Michigan State University for assistance in development of the survey instrument. FINPACK™ is a financial management software program developed and supported by the Center for Farm Financial Management, Department of Agricultural Applied Economics, University of Minnesota. Obtain more information at [www.cffm.umn.edu](http://www.cffm.umn.edu)

#### References

1. Financial Guidelines for Agricultural Producers, Farm Financial Standards Council, 1997  
[www.ffsc.org](http://www.ffsc.org)

This paper may be downloaded at <http://ww.msu.edu/user/nott>

FINLRB Review

Farm Interview date\_\_\_\_\_

Farm Code\_\_\_\_\_ File Name\_\_\_\_\_ State\_\_\_\_\_

Phones\_\_\_\_\_

Thank you for granting this interview and the permission to use your computerized financial files. No individual farm information will be released; only summary information of at least six farms will be used.

1. Date of FINLRB run \_\_\_\_\_ Date of FINAN run(s) \_\_\_\_\_

Milk price used\_\_\_\_\_

2. Which FINLRB alternative did you use as your final estimate? \_\_\_\_\_

Alt.1\_\_\_\_\_Alt.2\_\_\_\_\_ Alt3\_\_\_\_\_ Alt4\_\_\_\_\_ Alt 5\_\_\_\_\_ Alt 6\_\_\_\_\_

3. When did you reach your goals used in the FINLRB?

Facility completion date \_\_\_\_\_ Cow no. before\_\_\_\_\_ after

Milk production per cow before\_\_\_\_\_ after

How much of the change is attributed to the FINLRB use \_\_\_\_\_%

4. How useful was the FINLRB in the following decisions?

Est. cow numbers needed? Little Some Very Extremely

Compiled projected investment #s Little Some Very Extremely

Met lenders requests Little Some Very Extremely

Met owners need of project viability Little Some Very Extremely

Other \_\_\_\_\_  
\_\_\_\_\_

5. What compounding problems did you encounter in the expansion phase?

Cow health/biosecurity	None	Minor	Some	Major
Labor needs	None	Minor	Some	Major
Management change	None	Minor	Some	Major
Milk production per cow	None	Minor	Some	Major
Feed shortage	None	Minor	Some	Major
Manure issues	None	Minor	Some	Major
Replacements	None	Minor	Some	Major

Other \_\_\_\_\_

6. How well did the FINLRB mimic the actual financial need of the project + or - in

A. Dollar amount            0%    5%    10%    15%    20%    25%

B. Timing, in months \_\_\_\_\_

C. Advance year spending? \_\_\_\_\_

7. Which component of the project that was underestimated / overestimated by the FINLRB? \_\_\_\_\_

How could this be corrected? \_\_\_\_\_

Note: Cost overruns chosen by the farm \_\_\_\_\_

8. What was your new investment in the project?

# \_\_\_\_\_ **Cows** \$ \_\_\_\_\_

**Buildings** \$ \_\_\_\_\_

# stalls \_\_\_\_\_ **Parlor** \$ \_\_\_\_\_

# FS \_\_\_\_\_ **Barns** \$ \_\_\_\_\_

**Equipment** \$ \_\_\_\_\_

Field equipment \$ \_\_\_\_\_

Feed equipment \$ \_\_\_\_\_

Manure \$ \_\_\_\_\_

Parlor Description D \_\_\_\_\_ make \_\_\_\_\_ Automation? \_\_\_\_\_

9. What is your assessment of the quality of the FINLRB tool?

A. Ease of use?	Little	Some	Very	Extremely
B. Clarity of output / results	Little	Some	Very	Extremely
C. Assisted in lender decision	Little	Some	Very	Extremely
D. Availability	Little	Some	Very	Extremely
E. Time requirement	Little	Some	Very	Extremely
F. Overall usefulness	Little	Some	Very	Extremely

10. How would you assess the quality of technical assistance conducting the FINLRB?

Person conducting FINLRB    Little                  Some                  Very                  Extremely

FINPACK support?                  Little                  Some                  Very                  Extremely

11. Any FINLRB discrepancies/problems? \_\_\_\_\_

12. How did you learn about FINLRB?

A. Referral from \_\_\_\_\_ B. Extension \_\_\_\_\_ C. New clientele \_\_\_\_\_

13. Would you recommend this program to your neighbors?

A. Definitely yes \_\_\_\_\_ B. Not sure \_\_\_\_\_ C. Definitely not \_\_\_\_\_

14. How much would you be willing to pay for these FINLRB results?    \$ \_\_\_\_\_

15. Did the FINLRB results assist your decision in not investing in an alternative or enterprise you were considering? \_\_\_\_\_

16. Your primary use of the FINLRB is characterized as

A. Initial                  B. With actual bid \$\$                  C. What Ifs exploration?

Notes \_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_