

As previously indicated, the accuracy of any capital budgeting process is highly dependent on the accuracy of the data used to formulate the budget. Therefore, the importance of sound, realistic estimates for capital expenditures, forecasted revenues and expenses, discount rate, length of planning horizon, and other input data cannot be overemphasized. All data used in this example analysis represent the best estimates of the authors at the time of publication. However, these data should not be relied upon in an actual budgeting situation. Each budgeting situation demands collection of new data that best represents the time, place, and circumstances involved.

### Using spreadsheets as an analysis aid

Once you have collected all of the capital expenditure and estimated cash flow information, it is necessary to put it into a form so the capital budget analysis can be completed. Excellent tools for organizing and managing this information are microcomputer spreadsheet programs. For our example analysis of a 1,200 cow dairy, we have set up a spreadsheet. (The spreadsheet template is available in Microsoft Excel® for Apple Macintosh® computers and for IBM compatible computers (requires Microsoft Windows®). This spreadsheet has four main areas that drive the calculations necessary to analyze the project:

1. Capital expenditures (Exhibit 1): This information is used directly in the analysis. When coupled with additional input data, it provides information necessary to calculate principal payments, interest payments, and depreciation. These are necessary to calculate estimated cash flows.
2. Input data (Exhibit 2): This area of the spreadsheet provides the information on revenue/expense drivers and financing necessary to calculate estimated cash flows. Information is also entered here that determines how the investment will be retired and how the retirement value will be determined.
3. Cash income statement (Exhibit 3): This area produces an estimated cash income statement for each year of the 20-year dairy investment. It is set up in a contribution margin format (i.e., variable and fixed cash expenses separated) so that a breakeven analysis can be performed for each year. In addition, each year can be expanded (see year 20) to show cash revenues and expenses per

cow, per cwt, and a percentage analysis of cash revenues and expenses.

4. Investment analysis summary (Exhibit 4): This area gives a brief summary of the investment analysis. It provides measures of profitability, NPV, average ROR, and PP for the investment, and a summary of estimated net cash income (total and yearly). In addition, it shows the total equity and debt capital required for the investment and a breakeven analysis for herd size, milk sold per cow, and milk price. Actual milk sold per cow is also shown.

Secondary areas of the spreadsheet, not shown in this publication, show the amortization schedule for the original investment and capital replacement; equipment and building depreciation schedule; cow depreciation and gain/loss schedule; and a NPV calculation table showing each year's discounted, after-tax revenues, expenses, and depreciation tax shield.

Exhibits 1 through 4 represent the results of an example analysis. First, data on capital expenditures was collected and entered into the appropriate areas of Exhibit 1. Second, based on actual operating information from four large Florida dairy farms (July 1991 - June 1992), information on revenue/expense drivers and prices was entered into Exhibit 2. Third, interest rate information for financing the investment was entered into Exhibit 2 based on current market conditions. Additionally, term lengths of financing and depreciation information and investment retirement information was entered into Exhibit 2. After all of this information was entered into these two areas of the spreadsheet, the program automatically generated the cash income statement shown in Exhibit 3 (only years 1 to 5 and year 20 are shown) and the investment analysis summary shown in Exhibit 4.

The results of this analysis (Exhibit 4) indicate, given the conditions and assumptions of the input data (Exhibits 1 and 2), the dairy would be a sound investment from a profitability standpoint with a positive NPV of \$1,996,159, an IRR above the discount rate at 13.45%, and an "in-pocket" ROR of 6.71%.

However, the analysis also indicates the possibility of cash flow problems during the first 2 or 3 years, making the project's feasibility less certain. The primary reasons for low initial cash flows are the