

South Dakota State University  
**Open PRAIRIE: Open Public Research Access Institutional  
Repository and Information Exchange**

---

Economics Commentator

Department of Economics

---

3-17-1993

## Partial Farm Budgeting; Value Based Marketing in the Beef Industry

Burton Pflueger

*South Dakota State University*, burton.pflueger@sdstate.edu


Dillion Feuz

*South Dakota State University*

John Wagner

*South Dakota State University*

Follow this and additional works at: [http://openprairie.sdstate.edu/econ\\_comm](http://openprairie.sdstate.edu/econ_comm)

 Part of the [Agricultural and Resource Economics Commons](#), and the [Regional Economics Commons](#)

---

### Recommended Citation

Pflueger, Burton; Feuz, Dillion; and Wagner, John, "Partial Farm Budgeting; Value Based Marketing in the Beef Industry" (1993).  
*Economics Commentator*. Paper 288.

[http://openprairie.sdstate.edu/econ\\_comm/288](http://openprairie.sdstate.edu/econ_comm/288)

This Newsletter is brought to you for free and open access by the Department of Economics at Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in Economics Commentator by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact michael.biondo@sdstate.edu.



## PARTIAL FARM BUDGETING

by  
Burton Pflueger  
Extension Economist  
Farm Financial Management

An earlier issue of the Commentator discussed many aspects of diversification. Farmers and ranchers considering those aspects may be anticipating changes in their operations. Additionally, the 1992 growing season and the new political administration and policies have many producers wondering what changes to make in their operations for 1993.

It is important to analyze (push a pencil) those changes on paper before making the commitment of land, labor and capital necessary to facilitate those changes. While whole-farm analyses are best to fully understand the impacts of alternative operating plans, many of the changes being considered can be adequately analyzed using a partial budget.

A partial budget is a tool well suited to analyze the economic impacts of changes being considered that are small relative to the overall business. That is, partial budgeting is suitable where large parts of the operation will not be affected by the change being considered. A partial budget considers only the costs and returns that will be affected by the proposed change.

This is not to discount the usefulness of whole-farm analysis in analyzing changes to an operation, but there is no need to consider such a comprehensive tool when a simpler, quicker, and equally appropriate analysis will do. However, if the change being considered will impact several aspects of the business, it is better to use whole-farm analyses techniques. The danger of overlooking important variables can outweigh the savings of time and effort (Continued on p.2)



## VALUE BASED MARKETING IN THE BEEF INDUSTRY

Dillon Feuz  
Agricultural Economist  
and  
John Wagner  
Animal Scientist

What is value based marketing? The National Cattleman's Association (NCA) defined value based marketing as a marketing system that "transmits consumer preference for taste and leanness throughout the beef distribution and production chain." A market that operates efficiently must generate the appropriate market signals (usually in the form of increased profits) throughout the marketing and production system to achieve the desired product mix of consumers.

How will value based marketing affect South Dakota cattle producers? On-going research at South Dakota State University suggests that on average producers in the state would benefit from a value based marketing system. Over two years of a retained ownership project, revenue per steer would have averaged \$888 had the cattle been sold through a proposed value based marketing system. That compares to \$879, \$876, or \$859 per steer from selling on a grade and yield, dressed weight, or live weight marketing basis.

These returns were averages for 153 pens of cattle. Some of the pens of cattle, however, received greater revenue through live weight or dressed weight marketing than through the grade and yield or value based methods. What determines the marketing method that will result in the greatest revenue for a specific pen of steers? The primary factors are the dressing percentage, degree of marbling, and amount of fat cover.

Dressing percentage and fat cover are highly interrelated, in that as a steer becomes fatter the dressing percentage (Continued on p.5)

(Partial ... cont. from p.1)  
associated with using the simpler budgeting technique.

### Evaluation Criteria

It is important to know what financial criterion will be used to evaluate the financial impacts of the changes being considered. Historically profitability has been the most widely used criterion. Today, however, the aspects of cash flow and risk are also needing to be considered.

### Partial Budgeting Profitability Analysis

The preparation of a partial budget requires that the data be organized in a manner that minimizes the chances of overlooking some variable or counting some variable twice. Asking what the overall impacts of the change on the business are will help in determining if the change will help the business (improve profits or cash flow) or hurt the business.

Partial budgeting can be done with a simple ledger or "T" account where on the left all the positive impacts are listed and on the right all the negative impacts are listed. Obviously, for a change to be beneficial, the positive impacts must be greater than the negative impacts.

POSITIVES	NEGATIVES
Added Income	Reduced Income
Reduced Cost	Added Cost

The positive impacts will fall into one of two categories. One possibility is that the change will result in new or additional income that would otherwise not be received. The second possibility is that the change will reduce or eliminate costs. These two effects considered together total the income increasing effects of a change.

On the negative side, income could be decreased in two ways also. First, new or additional costs could be incurred as a result of the changes being considered.

Second, there may be some returns that would be reduced or eliminated if the change being considered is implemented. As an example of lost income, a farmer or rancher may have to drop one enterprise to expand another. These two considerations would total together for the income decreasing effects.

Not every change considered will affect the operation in all four categories. One of the more difficult aspects of partial budgeting is deciding which costs and returns are going to be affected by a change in the farming operation. It is important to keep in mind that one of the main reasons for using partial budgeting analysis is that no concern needs to be given to those costs and returns that will not be affected.

### Liquidity Impacts

As mentioned earlier, in addition to deciding whether a change will be profitable, it is important to determine if the cash flow impacts will provide sufficient cash to cover the financial obligations in a timely manner. One approach to determining the cash flow impacts would be to include a second column on each side of the "T" for the analysis that would be concerned only with the cash effects of a change.

Possible adjustments to the profitability considerations examined above may include interest where the actual cash cost would be considered, not the opportunity cost of capital. Related to the interest cost is the need to include the principal payments on loans that were not included in the profitability calculations since these payments are not considered a business expense. They do need to be considered in the liquidity analysis, however, since principle payments will drain cash from other parts of the business until the loan is paid off.

### Risk Impacts

To analyze the effect on the risk position of the business, the same type of analyses for risk would need to be conducted. Some considerations to keep in mind during the analysis of the risk of a

change in the operation would be the effect on labor availability and the resulting effect on the returns of other enterprises; the effect on the credit worthiness of the business if funds need to be borrowed to finance the change being considered; and the impact of a bad year for the change being considered.

Many times the affect on the risk of the operation can be determined by conducting a sensitivity analysis on some of the key variables being considered. For example, prices or costs could be varied to determine the effect on the outcome of the analysis.

### Break-Even Analysis

A determination of the sensitivity of the outcome can be made by examining how much the key variables need to change before the change being considered is no longer profitable. This is done through a break-even analysis in which the value of an important key variable that would result in the change being considered having no effect on profitability is computed. Then, judging the likelihood that the key variable would be higher or lower than the computed value will give an indication as to the feasibility of making the change considered.

### Limitation

While partial budgeting is an extremely useful and flexible tool for analyzing business decisions, there are some limitations that need to be noted.

First, a partial budget compares only two alternatives. To determine the best solution or to choose the profit-maximizing alternative, all possible changes would need to be considered.

Second, it must be realized that the answers from partial budget analysis are no better than the information used to conduct the analysis. Good records and sound business judgment are still a must.

Additionally, partial budget analysis does not in most cases account for the time value of money. Other analytical procedures could be used to make this determination or more detailed analysis could be done with partial budget

analysis, but this would make partial budgeting no longer quick and easy.

Lastly, as already mentioned, only those items affected by the change being considered are analyzed. It may be possible using partial budgeting techniques that some items may be forgotten or something may be overlooked. If a change being considered may possibly impact several aspects of a farming operation, whole-farm budgeting procedures should be used.

The above discussion familiarized readers with the categorizing the financial impacts of business changes. The following example will illustrate these concepts in detail.

### Example

Suppose a farmer named Max Profit has been custom-hiring a self-propelled swather to harvest his hay. He is now considering purchasing a new machine that will be operated by a hired laborer. Max has 250 acres of hay from which he gets an average of three cuttings per year. He has been paying \$14 per acre per cutting for the custom work. If he uses his own machinery, the additional labor will cost \$5.50 per hour.

The 14-foot swather can be purchased for \$29,500. It would have an estimated useful life of eight years, with a salvage value of \$7,000. It would be financed with an \$8,850 down payment and a \$20,650 loan that would be repaid with three equal, annual installments of \$8,895. The interest rate on the loan would be 14%. Max is in the 23% marginal tax bracket. (In other words, 23% is the tax rate Max would pay on any change in taxable income resulting from buying the machine.)

Max would want to analyze how will this investment would affect profitability? On the "Positives" side of the partial budget, under "added returns," we acknowledge the possibility that, with his own swather, Max might improve timing of harvest and therefore see an increase in hay quantity or quality. On the other hand, if Max has trouble getting work done on time, there could be a decrease in hay quality or quantity. This leaves a question mark in the analysis. Under

"reduced costs," Max will save the custom fee of \$10,500 per year. Total additions or income-increasing effects, then, are \$10,500 per year.

On the "Negatives" side of the partial budget are the costs of owning and operating a machine. Remember the components of these costs (depreciation, interest, repairs, taxes, insurance and shelter) which makes the acronym DIRTIS.

To calculate average depreciation expense over the machine's life, we subtract the salvage value (\$7,000) from the purchase cost (\$29,500) and divide by the years of useful life (eight) for an annual cost of \$2,812. In any given year, actual tax depreciation could be more or less than that depending on the depreciation method Max uses. Since we are trying to determine the average annual expense during the life of the machine, we'll use the \$2,812 value.

If Max has his capital tied up in this swather, he will forego other opportunities for investing that money. In general, this type of expense is called an opportunity cost which is a very real cost that should be considered before an investment can truly be considered profitable. To calculate the interest opportunity cost, first determine the average value of the investment (AVI) over its useful life and then multiply by an annual interest rate. The average value of a machine that wears out at an assumed constant rate is \$18,250 (the average of the beginning (\$29,500) and ending (\$7,000) values). Using the interest on farm loans for similar assets, (14%) gives an annual interest cost of \$2,555.

Next is repairs. Total repairs over the life of the machine are estimated as a percentage of the purchase price. The estimate repair costs are assumed to average \$1,324 per year.

Property tax and insurance along with shelter costs are also commonly calculated as a percentage of the average value of investment. All three costs can be estimated by multiplying the average value of the investment (\$18,250) times a rate per dollar of investment, assumed for this example to be 5.3%, for a total of \$967.

All costs mentioned so far (the exception being repairs) are regarded as fixed costs; costs that are not affected by how much the machine is used or even whether the machine is used. Variable cost, on the other hand, are costs that do change with, and are proportional to, machine use. On a average variable cost basis, cost stays pretty much constant as use increases. Fuel and labor expenses are determined by the number of hours a machine is used.

In the category of variable costs are fuel, lubrication and labor expenses. In the swather example, fuel costs are estimated at \$1.10/gal. X .2 hr./acre X cuttings X 4.8 gal./hr X 1.1, which equals \$871. The 1.1 factor is used to estimate lubrication costs at 10% of fuel costs. Hired labor cost is .22 hr./acre X 250 acres X three cuttings X \$5.50/hr., which equals \$907. Even if Max was using his own unpaid labor, it would be appropriate to include a charge for it.

Reviewing the added costs on the "Negatives" side, we have depreciation, \$2,812; interest, \$2,555; repairs, \$1,324; taxes, insurance and shelter, \$967; fuel and lubricants, \$871; and hired labor, \$907; for a total of \$9,436.

In this example, we have no items under the category of reduced returns (unless Max expects to do a worse job of harvesting than the custom operator). Total "Negatives", or income-reducing effects, therefore, are \$9,436.

We can now assess the overall profitability of the proposed change. Total additions (\$10,500) minus total subtractions (\$9,436) leaves an increase of \$1,064 if Max buys the swather. But that is before income taxes are subtracted. Max will only realize 77% of the before-tax profit (1 - .23 marginal tax rate), or \$819.

Since we have included a charge for all resources except management, the \$819 increased income should be thought of as compensation to the operator for management and additional financial risk. Is \$819 enough to make the investment worthwhile? That's a question only Max can answer in light of alternative uses of his

time and money, and his feelings about risk.

The above example has only illustrated the profitability impacts of the investment being considered. If readers are interested in how the analysis could be adjusted to account for liquidity and risk, they are encouraged to contact the author.

The Farm Management staff of the SDSU Cooperative Extension Service can help producers analyze changes to their operation. For reasons discussed in the article, our analyses are usually done on a whole-farm basis using the FINPACK computer software. FINPACK has been revised to be more flexible, provide more detail, and be easier to use. It provides a system of whole-farm analysis that can compare alternatives on a side-by-side basis. FINPACK is the most complete system that can be used by farmers and ranchers to do forward long-range planning, shorter-term cash flow planning, and year-end business analysis. All agricultural producers, and those agribusiness people who work with them, should examine the new FINPACK to determine how useful it might be for you.

\*\*\*\*\*

(Value Based ... Cont'd from p.1)

goes up. The feeding program and the number days fed can have a big impact on these two factors. So management of the cattle can dictate in part which marketing method to use. Lower dressing percentage would favor live weight marketing.

The ability to marble in cattle is primarily a genetic trait. Those cattle with the ability to marble should be marketed grade and yield or, if they can marble with a minimum of outside fat cover, they would be rewarded by a value based marketing approach. While it is true that some breeds tend to marble more than other breeds, the SDSU Retained Ownership Demonstration results showed that there was as much variation within breeds, as there was across breeds.

Research at the retail level has found that consumers want a consistent,

tasty, lean cut of beef and they want it at a fair price. The days of selling a steak in the retail beef case with an inch of fat around the outside are past. Consumers are concerned about cholesterol, about calories, about how they look. They view fat as being bad for them. However, they still want that steak to taste delicious, to be tender, and to be the same the next time they buy it. In general, taste and tenderness are closely related to the amount of marbling, or intramuscular fat, present in the beef.

Therefore, an efficient marketing system in the beef industry should be rewarding producers who are producing consistently marbled beef with a minimum of outside fat. Is that presently occurring in the beef industry? The short answer is no. In the NCA's quality audit entitled The War on Fat they state: "Excess fat production is stimulated in large part by a fundamental flaw in the marketing system for cattle and boxed beef -- a flaw that places the same value on trimmable fat as on edible lean."

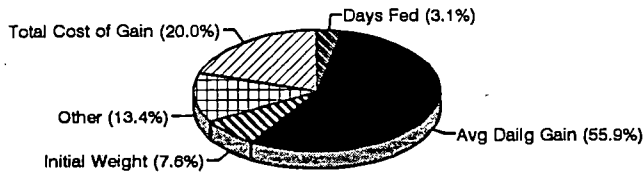
Data from the SDSU retained ownership project was examined to determine just how well alternative marketing methods were rewarding marbling and penalizing fat. Regression analysis was used to determine which performance traits or carcass characteristics had the greatest impact on explaining differences in profits. The figure containing the pie charts on the back of this sheet depicts a summary of the results for each marketing method.

Average daily gain and cost of gain in the feedlot explained over 75% of the variation in profit with live weight marketing. None of the carcass traits were significant. Dressing percentage was important for all of the carcass based methods. Quality grade (an indication of marbling) only showed up with grade and yield and the value based marketing system proposed by Excel Corp. Fat thickness was only important with the value based marketing approach.

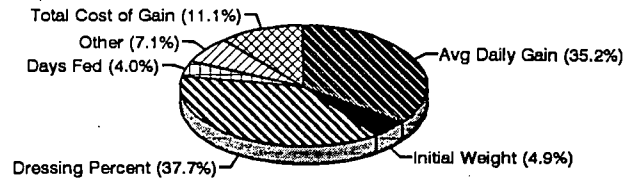
Clearly, the desires of the consumer for leaner meat are not reaching the producers in the form of profit incentives under present marketing methods.

# PROPORTION OF VARIATION IN PROFIT EXPLAINED BY SELECTED VARIABLES

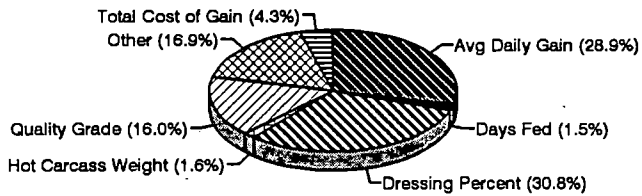
## Live Weight



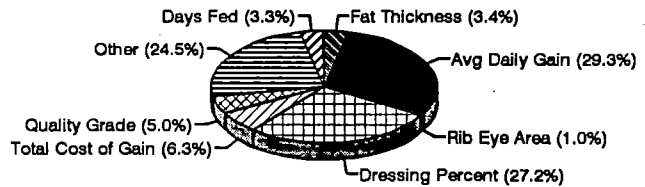
## Dressed Weight



## Grade & Yield



## Excel Muscle Score Proposed Value Based Marketing Approach



## ECONOMICS COMMENTATOR

EDITOR: Donald C. Taylor, Agricultural Economist

ECONOMICS DEPARTMENT  
South Dakota State University  
Box 504A  
Brookings, SD 57007  
Phone: (605) 688 - 4141



400 copies of this publication were produced at a cost of less than \$100.