

DAIRY ENTERPRISE BUDGETS FOR IOWA

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Importance of Enterprise Analysis

Farm businesses comprise many activities that complement or compete with one another, these parts being enterprise units. Many dairy operations maintain cropping enterprises in addition which typically have complementary resources such as feed and manure. Raising bull calves and feeding dairy steers is one example of enterprises that would compete with one another due to sharing of resources including feed, facilities, and labor. While a supplementary enterprise does not compete with or complement another enterprise, an example would be a dairy utilizing pasture that cannot be utilized for alternative methods.

Enterprise analysis is the evaluation of an enterprise to determine the profitability of the associated activity. Analysis can determine financial contribution to the business as a whole, impact of a change within the enterprise, value of cost of production, and value or return to a resource. This analysis can be done with historical or projected values. Additionally, it can be completed on any desired time frame; typically, enterprise analysis is completed on a yearly or production cycle time period.

Enterprise analysis can provide insight to the financial profitability and contribution of one activity to the whole business; however, if being utilized for a decision one should determine a decision criterion prior to analysis to compare the results with. Enterprise analysis can hold a lot of value and be an important financial tool if revenues, costs, labor, land, and capital are allocated correctly.

Enterprise analysis should be completed on all parts of a business to determine how each enterprise utilizes the business resources and contributes to the business financially. When reviewing each enterprise one should keep in mind how it contributes to the whole farm business goal/strategy in comparison with the other enterprises.

Use of Enterprise Budgets

Enterprise budgets allow one to evaluate expected revenue including quantity of output and additional sources of income. On the cost side, one can evaluate the feed, operating inputs, buildings and equipment investment, labor resources, and other inputs required. These revenues and costs then lead to the profitability of the enterprise which can also be measured on a per unit basis.

Budgets shown with this publication are for the average producer given the associated production and herd type parameters. Additionally, the budgets use industry averages or standards as assumptions for various calculations which

may vary from an individual farm's management practices. These numbers are to be used for education and planning; when real farm data is available, it should be substituted to obtain an accurate representation of the given operation. Therefore, producer must evaluate their given resources, level of input quantities and related prices, and expected output to determine variance of profitability from the calculated net return per herd or unit.

Iowa Dairy Budgets

Volatility in the commodity markets has increased in recent years which has affected dairy profitability through milk and feed input prices. The bottom line of an enterprise budget is the net return which measures the profitability of a dairy business at the current point of time and viability of the operation to remain in business. Dairy profitability is primarily driven by milk price and production on the revenue side and on the expense side by feed and replacement costs. Measures of net returns given varying levels of production based on type of management and/or cow type is needed for producers to gauge the current financial outlook for the dairy industry.

General Outline

The dairy budgets are estimates of production output, revenue, and costs for the associated enterprise structure. Inputs reflect average prices levels for the given time frame. Data was obtained from market price data, research, and farm records.

For each sample budget, inputs are categorized as herd data, income, or expenses. Herd data includes the assumptions for RHA, herd size, cow weight, cull rate, and age at first calving. All income and expense inputs are listed on the left side of the budget with the associated input amount and correlated price value. Outputs are calculated by hundredweight equivalents of milk produced and per cow. Outputs are calculated for the total herd accounting for cows only and cows and heifers.

Total income on hundredweight milk sold output is calculated as hundredweight of milk equivalent at given milk price. Hundredweight equivalents are means to more accurately measure cost of production relative to mailbox milk prices. The dollar value of non-milk revenue is divided by the inputted milk price to give a hundredweight equivalent. The hundredweight equivalents are then added together to give a total hundredweight equivalents.

The total feed costs and expenses are also calculated to help gauge profit margins. The budgets are summarized

with net returns after all costs including labor and assets. All budgets also include a heifer raising budget that includes all associated feed, livestock, facilities, equipment, ownership, and labor cost. In the heifer budgets a cost per head per day is calculated after total variable and labor costs; total cost and age adjusted cost are also calculated for this budget.

Each budget includes expected cash and non-cash incomes, expenses, and net returns. Income and expenses are calculated using assumed production methods, feed rations, and costs given each scenario. Sources of income for each budget includes sale of milk, cull cows, manure, and wet bull and heifer calves. Expenses are defined as feed, livestock, facilities and equipment, cow ownership, heifer replacement, and labor and management costs. Typically costs are defined as fixed and variable costs. Variable costs will vary depending on the level of production or herd size; these costs include feed, livestock, heifer replacement, and labor and management costs.

Fixed costs will occur regardless of herd size or production and includes associated costs for facilities and equipment and cow ownership. These costs account for the depreciation, interest, repairs, taxes, and insurance for facilities and equipment and interest and insurance for cow investment. Additionally, cow ownership costs are an opportunity cost of capital invested in the livestock.

Input prices and percentages used for income and expenses reflect price levels for the given quarter or annual year based on time of publication.

Assumptions are based for each type of dairy enterprise based on typical production, cow weight, replacement rate, calving interval, feed rations, and cost levels, investment cost, and required labor based on industry standards.

Assumptions Include:

Rolling herd average (RHA) is based on the type of animal and operation the associated budget represents; this ranges from 12,000 to 30,000 pounds. Cow weight, cull rate, and age at first calving amount are determined by the type of the animal which the budget represents.

Milk sales are determined by the annual production (RHA) per cow and milk price reported. Milk price for each budget is representative of the typical price received given the type of cow. All Milk Price for Iowa is used and adjusted by expected component levels. Small and cross breeds receive a price representative of higher components and lower production while large breeds receive a price for average components and production.

Calf sales are based on given market prices for bull and heifer calves as wet calves (less than two weeks of age). The number of bull or heifer calves sold is based on the stillborn rate for the given cow type. On average small breeds experience a six percent stillborn rate while larger breeds see a higher rate at nine percent. Manure sales are based

upon the size and breed of animal represented and related tons of organic matter nutrients available less hauling costs.

Total feed costs are determined by given market prices and rations. Hay price is reflective of 150 to 175 relative feed value (RFV) from local hay auctions across Iowa. Pasture is the weight average of alfalfa hay pasture and tillable farm ground rent for eastern Iowa according to the ISU Cash Rental Rate Survey; the weighted rent per acre is adjusted for dry matter tons per acre. Corn is based on the Iowa cash price and corn silage is calculated with a multiplier of 10 times the corn price. All other feed prices are reflective of current local market prices across Iowa. Ration formulations change between type of cow based on daily maintenance and production level requirements.

Livestock costs are representative of actual reported costs for a related dairy which includes supplies, hauling, veterinary and medicine, breeding, accounting, marketing, bedding, gas and fuel, electricity, and other costs for a dairy operation as reported in state budgets and dairy financial analysis reports.

Facilities and equipment costs include fixed costs for the milking center, livestock housing, manure storage, and equipment. Capital investment levels were derived from current facility investment estimates. The budgets assume facilities that are up to date or no more than seven years out of date. Associated percentages to calculate the value for depreciation, interest, repairs, taxes, and insurance is entered based on current rates.

Cow ownership costs account for the opportunity cost of investment; percent value for interest and insurance on mature cows is based on current rates entered. Cow ownership value is based upon market value based on local Iowa auction markets. Labor and management costs are based on entered wage rate per hour and number of hours per cow per year. The hours required per cow is expected to decrease as production level decreases. Heifer replacement costs reflect the average value to raise a heifer for a year's time frame; these costs are included in all cost categories used for the cow herd with heifers.

Dairy Enterprises Based on Production or Management

Across Iowa there is a wide variety of management practices and structures of dairy operations that make up the state's dairy industry. This publication includes estimates of production returns for multiple types of dairy enterprises in Iowa. These dairy enterprises represent varying levels of production for both pasture and conventional based systems. Estimates are intended to reflect average management intensity for the given level of production and dairy breed type.

PASTURE BASED SYSTEM

The dairy budgets for pasture based systems are budgets for dairies which utilize rotational grazing as part of their

management system. The 12,000 RHA represents a Jersey cross breed cow herd with low input facilities and management. The 15,000 RHA budget represents a medium framed cross bred cow while the 18,000 RHA budget represents a Holstein or large framed cross breed cow.

Assumptions for weight of cow ranged from 1,100 to 1,200 pounds calving from 22 to 24 months based on breed type. Additionally, replacement rate ranged from 21 to 27 percent for replacement rate based on breed type and type of management system. Lower input and smaller breed budgets have lower input costs and capital and labor requirements; however, they also have lower revenue due to lower production levels.

CONVENTIONAL BASED SYSTEM

The dairy budgets for conventional based systems are budgets for dairies which utilize a confinement housing model as the primary part of their management system. Budgets included represent 18,000, 22,000, 26,000, and 30,000 RHA levels for medium to large breed cows. Additionally, a 15,000 RHA budget is included for a Jersey breed herd.

Assumptions for weight of cow ranged from 1,100 to 1,350 pounds calving from 22 to 24 months based on breed type. Additionally, replacement rate ranged from 21 to 37 percent for replacement rate based on breed type and type of management system. Higher input and larger breed budgets have higher input costs and capital and labor requirements; however, they also have higher revenue due to increased production levels.

How to Use ISU Dairy Enterprise Budgets

All budgets can be downloaded as PDF documents or within an excel spreadsheet. The document provides for a base analysis while the excel spreadsheet allows the user to change inputs to reflect their herd.

The spreadsheet contains all eight budgets and three input sheets. The user can only change the prices or assumptions listed in the input sheets. In the 'Input – Prices' sheet, the user can enter their prices under the 'Producer' column and enter a '1' in the Time Period Selection and '0' in all other time frames. In the 'Input – Ration' and 'Input – Other', the user can change the ration, herd data, revenue, livestock costs, heifer costs, or facility and equipment cost assumptions to reflect their herd. These changes must be made under the corresponding budget reflective of their herd. Also available is a Facility and Equipment Value Calculator for the user to allocate machinery and facilities based on current value and percent use by the dairy enterprise. All values are then calculated on a per cow basis which can be entered in the 'Input – Other'. All values entered in the three input sheets are reflected in the budgets for individual farm enterprise analysis.

Also available is a blank budget template for a user to print and fill out all inputs and then correspond with an ISU Dairy Specialist to complete the dairy budget analysis.

End Comments

Enterprise analysis helps to allocate the limited resources of land, labor, and capital of an operation to specific enterprises to determine its profitability and contribution to the whole operation. Additionally, based on the contribution to whole farm profit and use of input resources, one can evaluate the proper enterprise mix for the operation. Enterprise analysis can also help to determine the desired selling price of a commodity or evaluate production practices and associated cost of production.

Individual farm factors such as availability to input suppliers and markets may affect costs and returns, so each farm should adjust the inputs to represent their own situation. ISU budgets can act as a benchmark for average enterprises in Iowa, comparison between system types or production levels, or a starting place to make adjustments for analysis or for future planning. One must note that dairy enterprise budgets measure profitability versus cash flow; therefore, additional analysis may need to be completed before making management decisions.

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Cooperative Extension Service, Iowa State University of Science and Technology, and the United States Department of Agriculture cooperating

Table 1. Market Price and Input Assumptions (January 2014 Projected)

Variable	Price (\$)	Unit
All Milk Price (Iowa)	19.25	hundredweight
Cull Cow	0.625	pound
Hay/Haylage	200.00	ton
Pasture Forage	253.00	rent per acre
Corn Silage	45.00	ton
Corn	4.50	bushel
By-product Feed	0.09	pound
Protein Supplement	0.24	pound
Salt and Minerals	0.61	pound
Fat Supplement	0.45	pound
Milk Replacer	1.11	pound
Calf Starter Feed	0.34	pound
Diesel Fuel	3.88	gallon
Labor rate	12.00	hour

Table 2. Annual Feed Rations by Enterprise Type

Feed Ration Components and Amounts										
Dairy Enterprise Type	Hay/Haylage, DM Tons	Pasture Forage, DM Tons	Corn Silage, DM Tons	Corn Equivalent, bushels	By Product Feed, pounds	Protein Supplement, pounds	Salt and Minerals, pounds	Fat Supplement, pounds	Milk Replacer/Calf Feed, pounds	
Jersey Cross Breed Cows on Pasture, 12,000 RHA	1.8	1.8	1.8	42	900	150	180	0.0	0.0	
Medium Cross Breed Cows on Pasture, 15,000 RHA	2.0	2.0	2.0	48	1200	150	220	0.0	0.0	
Holstein/Holstein Cross Breed Cows on Pasture, 18,000 RHA	2.0	2.0	2.0	52	1460	200	250	0.0	0.0	
Jersey Cows in Conventional System, 15,000 RHA	2.55	0.0	2.55	48	1200	300	220	0.0	0.0	
Low Production Cows in Conventional System, 18,000 RHA	2.85	0.0	2.85	60	1460	200	250	0.0	0.0	
Average Production Cows in Conventional System, 22,000 RHA	2.80	0.0	2.8	78	1825	600	285	0.0	0.0	
Average Production cows in Conventional System, 26,000 RHA	2.80	0.0	2.8	92	2130	750	320	180	0.0	
High Production Cows in Conventional System, 30,000 RHA	3.0	0.0	3.0	82	2450	1000	365	365	0.0	
Jersey Cross Bred Heifers on Pasture	1.5	1.25	0.75	26	0.0	500	50	0.0	200	
Medium Cross Breed Heifers on Pasture	1.75	1.25	0.75	26	0.0	500	50	0.0	200	
Holstein/ Cross Breed Heifers on Pasture	2.50	1.25	0.75	26	0.0	500	50	0.0	200	
Jersey Heifers in Conventional System	2.00	0.75	0.75	26	0.0	500	50	0.0	200	
Low Production Herd Heifers in Conventional System	2.50	1.25	0.75	26	0.0	720	50	3.0	200	
Average Production Herd Heifers in Conventional System	2.50	1.25	0.75	26	0.0	720	50	3.0	200	