

ORGANIC REPLACEMENT HEIFER ENTERPRISE BUDGET FOR
WALKER DAIRY

Presented to the
Faculty of the Agribusiness Department
California Polytechnic State University

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science

By

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March 2011

APPROVAL PAGE

TITLE: Organic Replacement Heifer Enterprise
Budget For Walker Dairy

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DATE SUBMITTED: March 2011

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ABSTRACT

This study was undertaken to determine if Walker Dairy could raise replacement heifers cheaper than the current market price.

The main objective of this report was to calculate how much is cost Walker Dairy to raise a heifer per head. Data collected went into the development of a heifer enterprise budget and determining an average market price. Transfer value in (drop calf price), feed, labor, operating and fixed costs were all factored into the in to the total cost per animal. Also, the data was broken into four different sections of a heifers' life to aid management in evaluating the cost of raising heifers.

There were two costs that were compared to the market price which was derived from what Walker Dairy pays for replacements. The first cost was based on all costs including opportunity costs and the second was all costs minus opportunity costs. Therefore allowing the dairy to realize the benefits of its opportunity costs, but also realizing how the dairy compared to the market at raising heifers.

It was found that Walker Dairy can indeed raise heifers cheaper than the market price when opportunity costs weren't factored into the total cost per head. However, when comparing the market price of heifers with the dairies' total cost of raising heifers, the market price was in fact lower. This information should be highly beneficial to the dairies' management in order make necessary adjustments to lowering the cost of raising their heifers.

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CHAPTER 1

INTRODUCTION

Due to the high demand of organic milk over the last decade, organic milk production has been one of the fastest growing segments of organic agriculture in the United States. From 2000 to 2005, the number of certified organic dairy cows on United States farms increased from 38,000 to 86,000 (an annual increase of 25% a year) and the amount of certified pastured has increased from 557,167 acres in 2000 to 2,281,408 acres in 2005. This increase in organic cows and acreage comes mostly from conventional cows switching to organic to enhance profitability (McBride). However, new rules created by the USDA forbid the transition of conventional cows to organic cows. Therefore the most efficient way to increase herd numbers and maintain/increase milk production is through replacement heifers. The most common replacement strategies for dairies are to raise heifers on site and to buy heifers on the open market in places such as auctions or transactions between cattle buyers/sellers and dairymen.

For most dairies, raising replacement heifers is one of the largest costs (15-20% of the total milk production cost) associated in the business. The objective of raising replacement heifers is to minimize costs and maximize future profitability (Mourits) because until the heifer calves, the dairy operation is investing feed, labor, and capital without receiving any financial benefits (Gabler).

Problem Statement

Is it cheaper for Walker Dairy to raise organic replacement heifers or purchase them at market price?

Hypothesis

Walker Dairy can organic replacement heifers at a cheaper cost than purchasing organic heifers at the current market price.

Objectives

1. Create a spreadsheet for Walker Dairy to calculate the cost of raising a replacement heifer.
2. Determine the average market price for an organic Holstein and Jersey heifer.
3. To reduce overall costs of raising replacements for Walker Dairy by finding outstanding expenditures and reducing them.

Significance of the Study

With growing respect to the booming organic dairy industry nationally, this study will benefit current and future organic producers who want to recognize a cost efficient way to replace and grow their herds. The numbers used for this study will be real data from Walker Dairy's current operations and will be specifically designed for the company. The overall purpose of this plan is to find ways to help Walker Dairy cut its' replacement heifer program costs and grow the herd by the best means necessary.

CHAPTER 2

REVIEW OF LITERATURE

Under organic certification, Walker Dairy must conform to strict rules and regulations set forth by the USDA. Therefore it is imperative to gain an understanding of how raising a heifer organically differs from raising a heifer conventionally.

Organic Dairying: An Overview

The USDA defines organic agriculture as a “production system that is managed to respond to site-specific conditions by integrating cultural, biological and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity (McBride).” Certified organic milk production systems rely on ecologically based standards that prohibit the use of antibiotics and hormones in the cow herd and the use of synthetic chemicals in dairy feed production. Also, certified organic dairies are required to accommodate the cow’s natural nutritional and behavioral requirements therefore cows must have access to pasture (McBride). Due to the banning of chemicals, maintenance of pastures by using cover crops, manure as natural fertilizer, and strip grazing are key in maximizing soil activity and maintaining long term soil health.

At the core of organic dairying is pasture. By pasturing animals the need for synthetic fertilizers and insecticides is reduced because cows spread manure on the pasture while feeding. Having pastures that consist of many diverse grasses such as legumes and other broadleaf species provide multiple benefits for the soil and ecosystem.

To provide credibility for organic products, Congress passed the Organic Foods Production Act in 1990 to develop a national standard for organic food and fiber production.” This required the USDA to create rules and regulations that would be followed by producers and certifiers. The act also set up the National Organic Standards Board to assist the USDA in creating regulation and deciding what substances could be used in organic production (Friedman 2007). To provide more credibility to the industry, new laws passed by the USDA earlier this year require that cows graze on pasture for at least 120 days during the growing season (McBride).



Organic Costs

There are many factors that play into a healthy and sustainable dairy herd. In all dairy systems it is important to know that all dairy herds well-being depends on, “the management regime within the individual dairy system, the genetic merit of the cow, the nutritional quality of the diet, and the social environment in which the animal is kept (Marley).” In any herd, especially organic, it is important to always make improvements to the well-being of the herd and the facilities, because failure to do so could result in a lower profit margin.

In regards to an organic cow's diet, the milk production could be slightly lower than that of a conventional cow with equally superior genetics. However, if pasture based, the ability to cut feed costs during the summer month makes up for the decreased milk production based on lower quality feed that is grown off the farm. In most cases, organic means less milk production and greater profits. For example, Vince Voy and Debbie Yonkers of Vermont, transitioned their 70 cow dairy to organic and their production decreased by 10 to 15 percent, but their gross income increased \$125,000 to \$165,000. Lisa McCrory, dairy technical assistance coordinator for the Northeast Organic Farming Association of Vermont states that, "organic dairy producers almost always reduce their production numbers; due to management changes such as feeding the animals less grain (Friedman 2007)." Also, according to McCrory, even though the price of organic grain is higher, other costs such as veterinary bills, fertilizer and labor decrease, improving net income (2007).

Other areas where money can be lost deal with cow comfort. By reducing group sizes and providing enough allotted space, as organic standards define, milk production can actually go up. A good herdsman must carefully observe the herd to ensure cows are not too crowded, and are being fed a constant diet to maximize milk production. Poor husbandry can, "have negative consequences for livestock, farmers and consumers as it can seriously damage the welfare, productivity, product quality and profitability of farm animals (Marley)."

A Heifer' Life

To fully understand the inputs that are necessary in a heifer's life, it is important to understand the process of raising a heifer. When raising the heifer it is important to examine the feed consumed, treatments used and the cost of labor for each heifer.

A heifer calves chances of survival are most dependent on the first 24 hours of life. In this time span the calf is able to absorb antibodies, through colostrum, into the blood stream. This process is called passive transfer of immunity which the antibodies protect the calf's immune system until the calves own system becomes fully functional. In an organic dairy setting, the colostrum must come directly from the mother or another cow; not from any type of colostrums powder product. After the first feeding, it is important to dip the heifer's naval, give proper oral (E-coli, rota-, corona virus) and nasal (IBR, PI-3) vaccines. Also administered are vitamins A, D, E and selenium to prevent deficiencies (Fox).

A calf will be most susceptible to scours during the next 3-4 weeks. This also happens to be where death losses occur most often. E. coli, salmonella, and coccidia are just a few pathogens that can account for major financial losses to a dairy and affects the replacement strategy for the herd. Therefore organic treatments are needed to help rid of pathogens. The most common side effect is diarrhea which leads to dehydration. Electrolytes are most commonly administered orally through water and milk solutions to rehydrate the calf and in worst case scenarios given intravenously. Organic rules prohibit the use of antibiotics in any organic animal therefore to prevent suffering a calf may be given antibiotics to help it survive, but then must be culled from the herd because it has lost its' organic status (Fox).

Until the calf is weaned, its diet will consist of pasteurized waste milk and organic grain. Each calf is fed 4 pints a feeding which equates to one gallon a day. Grain consumption should be fed from day 3 till weaning. At about 60 days the calf will be eating roughly 2lbs of grain per day (Bach). At this point the calf is weaned and placed on a grain and alfalfa diet. The alfalfa helps stimulate rumen growth which in the next few months will develop into a fully functioning stomach. Then the energy from the grain and roughages consumed by the calf will be focused on skeletal development and maturation (Fox).

In most operations, calves are moved from individual housing to group pens after weaning. Grain consumption is decreased and roughages continue to increase after the calf reaches 6 months. Usually at around the age of six months, it is required in the state of California that heifers be vaccinated for brucellosis. The main goal after weaning is feeding the animal properly so it is ready to be bred at 13-15 months of age. Most dairy operations strive to breed heifers at 13-15 months and calve out at 22-24 months or at 1550 pounds for Holsteins (Bach). There are many benefits of shortening a heifer's time between weaning and first calf including decreased feed costs, shortening of the generation interval, and lower overhead costs. However, there are disadvantages such as dystocia, reduced longevity, decreased production per lactation and decreased level of body conditions that will effect further growth and reproduction. Due to the fact that Jerseys produce smaller calves than Holsteins would it is far safer to breed them earlier. However, a heifer must have sufficient body weight to reduce the incidence of dystocia. Heifers with high dystocia during the first calving could lead to pinched nerves, milk production losses and even death. (Mourits)



Enterprise Budget

Enterprise budgets are useful in businesses that have numerous income sources such as dairies and are purposeful for estimating costs, returns, and profit per unit. (Greaser). The time frame covered by an enterprise budget can be based on a yearly or multi-year budget if based on a long production process. Depending on the business, an enterprise budget is usually calculated on a per unit or per acre basis so comparisons can be made among different enterprises. For dairy purposes, the most common unit used is head or one cow unit. Prices used reflect market values and productivity of enterprise resources and can be difficult to calculate (Kay).

Costs are divided into variable and fixed costs. Variable costs are expenses that vary with output within a production period such as feed, labor, and breeding costs. Fixed costs do not vary with the level of output and include taxes, depreciation, and interest. Total costs are variable and fixed costs added together and subtracted from the revenue to determine whether there is a profit or loss. If there is a loss, an enterprise can be continued if its returns are above variable costs and

the losses will be seen as short term. However, if fixed costs cannot be covered in the long run, reinvestment in capital items such as tractors, buildings and equipment cannot be made and existing capital stock will be depleted (Greaser).

The information contained in these budgets can be used by the business owner in making important decisions about the business. Also in times where credit is needed, an accurate enterprise budget allows added support when applying for a farm loan. In a U.S Cooperative study by George Greaser, he says, “Enterprise budgets are important tools because they identify, in a single place, the income and expenses (both fixed and variable) associated with a single enterprise and any by-products that result from the production of the primary product.” In a business where there are multiple enterprises contributing to the bottom line, carefully prepared enterprise budgets can help determine which enterprises are most profitable, which are most labor-intensive, and which are of highest value (Greaser).

Enterprise budgets allow the efficiency of farm enterprises to be evaluated more economical. Income received for the enterprise is listed above the costs of inputs and practices used. A proper enterprise budget allows for dairies to estimate cost and benefits for major changes in production practices. For example, in a replacement heifer enterprise, a dairyman may find it is cheaper to purchase heifers at market price than to purchase expensive feed for the milk string to create a larger profit margin.

CHAPTER 3

METHODOLOGY

Procedures for Data Collection

Walker Dairy has requested an enterprise budget to be executed on the company's behalf for its replacement heifer program. The dairy, which is family owned and operated, seeks to cut costs and continually replace and expand the herd which consists of organic Jerseys and Holsteins. Recently, the dairy has been purchasing heifers to build the herd faster with respect to the current organic milk price. The study will determine whether it is cheaper to raise heifers on the dairy rather than purchase them at market price.

The most crucial set of information to collect is a list of inputs and quantities provided by Walker Dairy. The owner has granted permission to use the information in order to create the enterprise budgets and prices of the inputs must be collected by the author. The inputs, quantities and prices are important because they will allow the total cost for raising a replacement heifer to be calculated. Walker Dairy will provide information dating back two years not only to have a moderate sample size, but a two year time period also refers to a cow's time as a heifer.

In order to calculate the cost of raising replacement heifers, an enterprise budget will be used to estimate the costs for the herd and per head basis for variable and fixed costs. For variable costs, Walker Dairy lists its varieties of feed as hay, milk, grain and pasture. Also under variable costs are labor, fuel, breeding, utilities, veterinary, medical supplies, general supplies, insurance and other. Fixed costs include transfer value in, equipment and machinery, corrals and facilities, death losses, taxes and net rent.

The key component of the enterprise budget is to be flexible in estimating a variety of costs including operational objectives, feeding management, and labor management. To evaluate costs efficiently and accurately, heifers will be separated into age classes. Birth to weaning, weaning to 6 months, 6 months till bred and bred until two weeks before calving. By separating the age groups, the expenditures for different periods of a heifers' raising can be evaluated and opportunities for improvement should present themselves (Gabler).

The name and quantity used of each input has been provided by Walker Dairy; however, the information regarding costs of the inputs must be researched. Hay used by Walker Dairy for the rearing of replacement heifers is produced on the farm and also purchased from Finley Farms located in Fort Jones, Ca. Finley Farms will be contacted in order to find the price per ton of organic alfalfa. Hay bailed on the farm is an opportunity cost and will be assessed a fair market price. For a farm it is an asset to produce feed itself instead of paying market values for feed. Therefore for wrapped silage bales and grass hay, Jim Walker, the owner of Walker Dairy will be contacted to find the price per bale for silage and grass hay bales.

Organic grain consumed by heifers comes from Dairymen's Feed and Supply Co-op in Petaluma Ca. A price per ton figure will be needed and therefore a quote from company salesperson will be required. In order to calculate the value of heifers grazing on organic pasture, Mr. Walker will need to be questioned again. To get an accurate figure it would be sufficient to find the cost per acre for all the dairies' rented properties as this will provide a true value of the pasture whether it is currently grazing cattle or not.

The milk on which calves are raised will be priced at what it could be sold for on the market therefore it is an opportunity cost. However, since the milk fed is waste milk the price

will be lowered significantly based on the fact it couldn't be sold on the market, but possibly to another heifer replacement operation.

Ferndale Veterinary is the main provider of veterinary services to the dairy and Walker Dairy has provided information of what services the vet clinic has done in the past including brucellosis vaccination, minor surgeries, and necropsy. The costs of these services will be needed plus the vet's hourly rate in order to calculate the costs to go on the enterprise budget.

A major component in a young heifer's life relies on the use of organic treatment such as electrolytes (Deliver), vitamins (Muse), and other oral and nasal vaccines to prevent, treat and ensure the future health of a calf. These remedies and supplements are purchased R&S Supply in Ferndale and the owner Randy Rayl shall be asked for the prices of the inputs used for raising the heifers.

Walker dairy uses natural service to breed its heifers and are used as an alternative to artificial insemination. Bulls used to breed heifers are shipped from Ahlem Bulls in Hilmar Ca. Building and fencing inputs are purchased from Neilson Feed Co. in Ferndale Ca. Neilson Feed Co. will be contacted to find get prices for fencing, bedding, corrals and barn materials. The costs of utilities, insurance and taxes will be provided by Walker Dairy to the author. As for labor, the amount of unpaid and paid hours as well as an hourly rate paid to employees will be needed to calculate the cost per head. The fuel cost used will come from L&M Renner based on their bulk price of gas and diesel.

Transfer value in is based on what the animal is valued at the beginning of the period. For example, for the birth to weaning stage, the value will represent what a drop calf is worth. The dairy uses a CAT Skid steer and a tractor and mower for most of its heifer operations. These pieces of equipment along with corrals and facilities will be straight-line depreciated based on 20

year values. Death losses will be calculated based on the mortality rate for Walker Dairy. For example, if the dairy has a 5% death rate, then the possible profits from the calves that died will be added to the total cost. Taxes will be provided by Walker Dairy as there is no way to estimate these values.

Purchasing Heifers on the Market

In order to find market values of organic heifers, it is necessary to gather information from organic dairymen, auction yards, and cattle buyers. To collect essential data, a series of phone calls will be conducted with these firms and individuals. Among the people solicited will be Mr. Walker who purchases organic Holstein replacements and has years of experience and knowledge of the market for replacement heifers. Farmers Livestock Market, an auction yard in Modesto, Ca, will also be contacted in order to calculate prices for Holstein and Jersey organic heifers. Also, Ray Christi, a cattle buyer in northern Ca, will be contacted as well. Since the market for organic heifers isn't well established, the costs used to find average price will be based on actual purchases of springing heifers. The price Mr. Walker pays, along with the auction yard price and what Mr. Christi buys and sells heifers for will be averaged therefore being the determining figure.

The second objective is to find areas where Walker Dairy can reduce costs in raising replacement heifers. By creating four different enterprise budgets for each aspect of a heifer's life, the cost of raising heifers will be examined allowing for cost cutting changes to be made. The data will be presented to the Walker Dairy management in order to possibly find areas to cut costs in the replacement heifer program.

Procedures for Data Analysis

Once the data has been collected the author will organize and analyze the information to fulfill the objectives of the study. The objectives include creating an enterprise budget, lowering costs for the Walker dairy replacement heifer program, determine an average organic Holstein and Jersey heifer price and deciding whether is better to buy heifers at market price or raise them on the dairy. The data will also be analyzed to test the validity of the hypothesis, that Walker Dairy could raise heifers cheaper than purchasing them at a market price.

Enterprise Budget for Walker Dairy

The first collection of data to be analyzed is that pertaining to the development of an enterprise budget to calculate Walker Dairy's cost to raise a replacement heifer. By attributing responses from the data collected from Walker Dairy and sources of inputs which include price and quantity, the author will use that data formulate a spreadsheet using Microsoft Excel. To efficiently analyze the data, heifers will be grouped in to four distinct age categories: birth to weaning, weaning to six months, six months to twelve months and twelve months to twenty four months; therefore creating four separate enterprise budgets for each age group and one for entire replacement heifer enterprise. Note that when calculating figures for the age groups some inputs may not be listed. For example, during the 12-24 month stage, the heifer will not be fed grain or milk therefore the information is unnecessary. In each age category, the necessary inputs for the heifer raising process will be listed.

When creating the enterprise budget, the name of the enterprise and the budgeting unit are shown first. The heifer enterprise will cover the last two years of Walker Dairies' heifer replacement program in order because it takes two years from birth for a heifer to begin milk production. Next listed will be the revenue, or transfer value out, which typically includes quantity, unit, and price. In this situation, the revenue will equal what the author has determined from research is the average of organic Jersey and Holstein heifers. Underneath the revenue portion will be a list of assorted variable costs. Included will be hay, grain, milk and pasture. To determine the cost per head of each feed, formulas will be used for each one.

- Hay= (\$/bale x bales used)/head
- Grain=(#per day x \$/#/grain) x days
- Milk= (gallons per day x days x \$ per gallon)/head
- Pasture= total rent per year/head

Also under variable costs are labor and operating costs. Walker Dairies labor force for the replacement heifer program is compiled of family members and some hired labor therefore family labor will be assumed as an opportunity cost and be based on a fair price per hour. In order to calculate breeding costs accurately, the price per bull, bulls used, and number of pregnancies will be taken into consideration. Using those three figures, the cost of conception will be calculated. Operating costs include fuel, breeding, utilities, vet, general supplies, insurances and other. Other variable costs such as supplies will be easily calculated, taking the total bill and dividing by the number of animals.

- Labor costs:((unpaid + paid hours) x rate)/head
- Fuel: (gallons used x price per gallon)/head
- Breeding: (\$per bull x bulls used)/number of pregnancies

- Veterinary: (labor + supplies)/head
- General supplies, Insurances, and other: (total cost)/head

As in most enterprise budgets, total variable costs (TVC) will be calculated after the listing of the combined feed and operating costs.

The fixed costs, which are more difficult to calculate, will be listed underneath variable costs. They include transfer value in, equipment and machinery, corrals and facilities, death losses, taxes and net rent. Transfer value in equals the value of the animal at market price if the animal were sold and it carries over into each age group. This figure will grow throughout the budgets and no formula is necessary to calculate. As mentioned before, the equipment and machinery and corrals and facilities based on straight-line depreciation. Also, for death losses, a cost will be associated for the losses. The total amount of taxes will be provided by Walker Dairy and be divided by the number of animals used in the study to find the costs per head. After the fixed costs are added up, they will be summed with the total variable costs to equal total costs (TC). The number that reflects total costs will then be used as the average cost of raising a replacement heifer for Walker Dairy. This figure will also be used to support or reject the hypothesis when compared to the average price of an organic heifer.

The last collection of data to be analyzed is that pertaining to the market price of organic Jerseys and Holsteins. Currently, the market for organic heifers is very small and information relating to price tends to be scarce. The data provided by Mr. Walker, Mr. Christi and Farmers Livestock will then be turned into a very raw average in which the enterprise budget will be compared to. By analyzing the data gained through the information provided by Walker Dairy, evaluation of the enterprise budget and prices from cattle buyers within the industry, the author can determine if the hypothesis that raising organic replacement heifers on Walker Dairy is

cheaper than purchasing heifers on the market. If the enterprise budget shows that it is less expensive to raise heifers than to purchase them, then the hypothesis should be supported.

Assumptions

There are many assumptions to be made when comparing the cost of raising organic heifers versus buying them on the market. It is assumed the author has found a current and true average price for Holstein and Jersey heifers that will reflect without hindrance to the acceptance/ rejection of the hypothesis. Also, it is assumed that Walker Dairy will continue to grow and be successful, therefore using this study as a means to make wise decisions for herd expansion in the future. Lastly, it's assumed that although not being certified professionals, the people used for data in this study are industry experts and have provided accurate and true information.

Limitations

As the data provided for this study is entirely based on the operations of Walker Dairy, the cost-analysis study should not directly apply to other dairies which are not organic without data modifications. This study analyzes costs associated with current operations in the Ferndale, California, and can only be applied to other regions that experience similar feed programs for heifers and management techniques in the heifer replacement program. The information provided through interviews is from professionals in the industry therefore the information they provide

may not be the best or the most accurate since they may have adopted standards and values that do not represent the dairy industry as a whole. The forms or management and techniques used by Walker Dairy have proven to be productive for Mr. Walker, but may not be a great model for other heifer replacement programs.

Chapter 4

DEVELOPMENT OF THE STUDY

The data collected for analysis began on January 1, 2009 and ended on December 31, 2010. In that two year time frame, 450 heifer replacements were raised organically by Walker Dairy. When compiling the data, the author discovered two ways to of calculating the total cost of raising a heifer. The first method is accounting for all costs including opportunity costs to represent an inflated cost. Secondly, the true cost of Walker Dairy raising replacement heifers is total cost minus all opportunity costs.

Table 1. Costs with and without Opportunity Costs

Cost		Per Head	Minus Opportunity Costs
Transfer Value In		\$ 80.00	\$ 80.00
Total Variable Costs		\$1,549.23	\$ 1,003.64
Total Fixed Costs		\$ 224.82	\$ 197.53
Total Costs		\$1,774.05	\$ 1,201.17
Transfer Value Out		\$1,854.05	\$ 1,281.17

The chart shows that when Walker Dairy includes opportunity costs, it costs \$545.59 more than the actual cost to raise a heifer when subtracting the opportunity costs. However, although it is an inflated number it is important to understand what it costs to raise a heifer based on market costs. To find the opportunity cost, milk for calves, family labor and dry cow hay were subtracted because the milk is waste milk and comes directly from the dairy. Family labor is not paid for and dry cow hay is made by the dairy. The main opportunity cost that was adjusted was the cost of pasture.

Table 2. Opportunity Cost for Pasture

				Minus
		Acres	Per Head	Opportunity Costs
Pasture		1011	\$ 785.50	\$ 438.88

The opportunity cost for pasture was calculated by subtracted the amount of owned pasture from total pasture used. Therefore the rest of per head cost for pasture is made up of pasture that is leased by Walker Dairy. By owning pasture the dairy is able to save \$346.62 per head for feed costs.

The second objective of this project was to determine an average market price for organic Jersey and Holstein heifers. From the data received from Mr. Christi, Farmers, and Jim Walker the average price for which the author has calculated is to be \$1550 per head for both breeds. Sometimes there tends to be a discrepancy between the two breeds but currently they are being bought at the same price. Also, when buying heifers there is an expected shipping fee of \$50 per head. Therefore the market price used for this project will be \$1600.

Table 3. Market Value vs. Walker Dairy Value

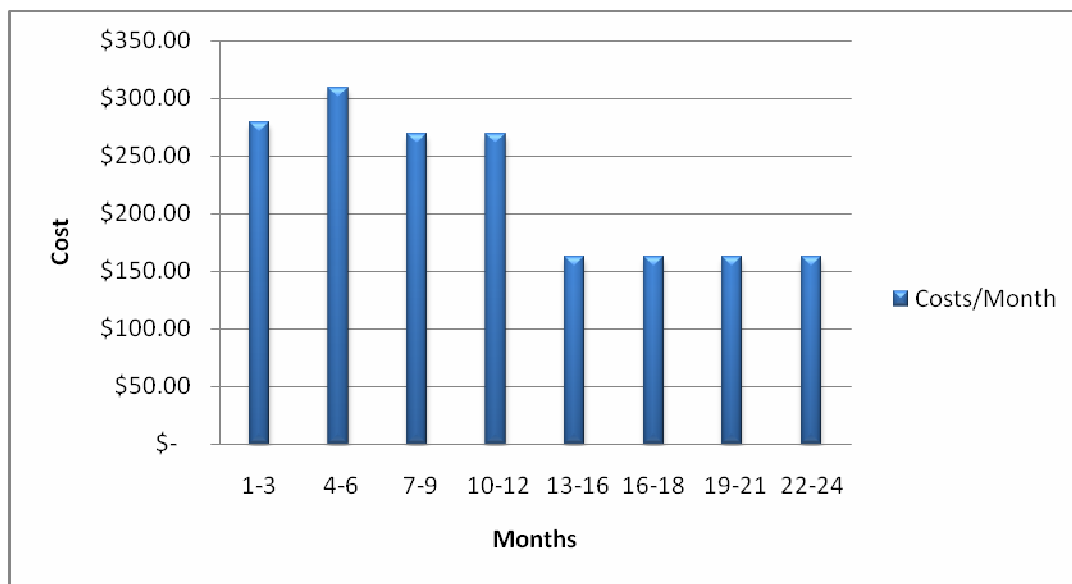
		Market Value	Walker Dairy +Opp. Costs	Walker Dairy no Opp. Costs
Per Head Cost		\$ 1,600.00	\$ 1,854.05	\$ 1,281.05
+/- market value			\$ (254.05)	\$ 318.95

In order to test the hypothesis, it needs to be determined that Walker Dairy does in fact raise heifers cheaper than the market price. According to table 3, it is \$318.95 cheaper to raise heifers than to buy them. However, in times when there are no heifers close to freshening, a

boost in milk production is needed or when herd numbers need to be increased then there is no other option than to buy heifers at the market price.

Another aspect of this project was to breakdown the costs in the timeline in a heifer's life which was done by creating four different age groups. This was done so that management could look at areas where outstanding expenditures could be found and reduced.

Table 4. Costs for each period examined in the study



Although the data was computed for four timeframes, in order to be presentable and analyzed more efficiently, it is more beneficial to examine the costs over eight, three month periods. These cost look good, but what sticks out is the 10-12 month old range. This number is inflated due to being averaged with the 7-9 month old group. There are two other possibilities for the 10-12 month old high costs. One, is that the grain cost for 7-9 is being factored into the total cost and secondly, that there may be some other outstanding cost that needs to be evaluated further.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECCOMENDATIONS

Summary

An enterprise budget plan was created to determine whether or not it is cheaper to buy replacement heifers at market price or have them raised by Walker Dairy. The financial and unit data was collected over a time span of two years in which 450 heifers were raised. Sources of the data ranged from the owner, feed suppliers, and general agriculture supply stores. The compiled data was organized to find the per head cost of raising a replacement heifer. Also, the data was organized into four sections which represent four different periods in a heifers life. The current budget is highly profitable if the dairy wanted to sell the heifers and could easily earn a profit of \$300-\$350 per head.

After the data was organized, the results were compared to the hypothesis. The completed data was also presented to the management of Walker Dairy to be analyzed and use for future decisions.

Conclusions

It was found that Walker Dairy does in fact raise heifers cheaper than market price when opportunity costs are subtracted from the actual cost of raising a heifer. The cost of inputs were looked at and analyzed to see how Walker Dairy could improve the cost of raising their heifers. For the heifer replacement program to be more profitable it would be useful to invest in more pasture to reduce the need for leasing land. In the short run, payments on the new properties will

offset the benefit of acquiring more pasture but in the long run the value of the new properties will take effect. An area that may lead to higher costs in the future will hired labor. Within the next year, all three of the family workers will be gone at once. At least one of these vacancies must be filled in order for daily activities at the dairy to function normally. This added cost of labor could add as much as \$60-70 per head for what used to be considered an opportunity cost.

Recommendations

My recommendation if anyone decides to do this project is to find more data that relates to a fair and accurate price for a springing heifer. Being a niche market, there aren't many organic heifer prices floating around. Not only because there aren't many transactions, but because prices aren't widely publicized therefore extra amounts of effort are need to compute an accurate price to use in a project such as this one.

Recommendations for the expansion of this project would be to start a two year study on several organic dairies and use yearly figures as to not have to research two years back in time to figure out the cost of raising a heifer. The timeline of that project would take longer, but the accuracy of it would be highly beneficial to other dairymen if made public.

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APPENDIX

Overall Costs for Replacement Walker Dairy

Walker Dairy								
Organic Heifer Replacement Budget Analysis								
								Opportunity
						Two Year		Costs
			Unit	Price	Quantity	Totals	Per Head	Per Head
Revenues								
	Transfer Value In		head	\$ 80.00	450	\$ 36,000.00	\$ 80.00	\$ 80.00
Variable Costs								
Feed								
	Milk		cwt	\$ 5.00	6278	\$ 31,390	\$ 69.76	\$ -
	Grain		ton	\$ 440.00	365	\$ 160,600	\$ 356.89	\$ 356.89
	Pasture		acre	\$ 349.65	1011	\$ 353,496	\$ 785.55	\$ 438.88
	Hay		ton	\$ 230.00	44	\$ 10,140	\$ 22.53	\$ 22.53
	Dry Cow Hay		ton	\$ 37.50	270	\$ 10,125	\$ 22.50	\$ -
	Subtotal Feed Costs					\$ 555,626	\$ 1,257.22	\$ 818.30
Labor							\$ -	
	Family		hour	\$ 12.00	4000	\$ 48,000	\$ 106.67	\$ -
	Hired		hour	\$ 13.50	300	\$ 4,050	\$ 9.00	\$ 9.00
	Subtotal Labor Costs					\$ 52,050	\$ 115.67	\$ 9.00
Operating Costs							\$ -	
	Straw		bale	\$ 6.50	720	\$ 4,680	\$ 10.40	\$ 10.40
	Inforce		dose	\$ 1.10	450	\$ 495	\$ 1.10	\$ 1.10
	Ivomec		dose	\$ 1.50	1800	\$ 2,700	\$ 6.00	\$ 6.00
	Deliver		scoop	\$ 1.00	2700	\$ 2,700	\$ 6.00	\$ 6.00
	8-way		cc	\$ 0.34	1800	\$ 612	\$ 1.36	\$ 1.36
	MUSE		cc	\$ 1.35	1350	\$ 1,823	\$ 4.05	\$ 4.05
	Fuel		gallon	\$ 4.00	4126	\$ 16,504	\$ 36.68	\$ 36.68
	Breeding		pregnancy	\$ 33.33	450	\$ 14,999	\$ 33.33	\$ 33.33
	Irrigation		enterprise			\$ 7,200	\$ 16.00	\$ 16.00
	General Supplies		enterprise			\$ 13,200	\$ 29.33	\$ 29.33
	Utilities		enterprise			\$ 14,440	\$ 32.09	\$ 32.09
	Subtotal Operating Costs					\$ 79,352	\$ 176.34	\$ 176.34
	Total Variable Costs					\$ 687,028	\$ 1,549.23	\$ 1,003.64
Fixed Costs								
	Death Losses		enterprise	5%		\$ 39,731	\$ 88.31	\$ 61.00
	Equipment		enterprise			\$ 15,000	\$ 33.33	\$ 33.33
	Corrals and Facilities		enterprise			\$ 12,000	\$ 26.67	\$ 26.67
	Taxes		enterprise			\$ 20,000	\$ 44.44	\$ 44.44
	Insurance		enterprise			\$ 14,440	\$ 32.09	\$ 32.09
	Total Fixed Costs					\$ 101,171	\$ 224.82	\$ 197.53
	Total Costs					\$ 788,199	\$ 1,774.05	\$ 1,201.17
	Transfer Value Out						\$ 1,854.05	\$ 1,281.17

Birth to Weaning

Walker Dairy Replacement Heifer Enterprise						
Birth to Weaning (3 months)						
		Unit	Price	Quantity	Three Month Value	
Revenues						
	Transfer Value In	head	\$ 80.00	1.00		\$ 80.00
Variable Costs						
Feed						
	Milk	cwt	\$ 5.00	13.95	\$ 69.76	
	Grain	lbs	\$ 440.00	0.16	\$ 71.37	
	Hay	bale	\$ 230.00	0.02	\$ 5.63	
	Subtotal Feed Costs					\$ 146.76
Labor						
	Family	hour	\$ 15.00	3.56	\$ 53.34	
	Hired	hour	\$ 13.50	0.50	\$ 6.75	
	Subtotal Labor Costs					\$ 60.09
Operating Costs						
	Straw	bale	\$ 6.50	1.60	\$ 10.40	
	Inforce	dose	\$ 1.10	1.00	\$ 1.10	
	Ivomec	dose	\$ 1.50	1.00	\$ 1.50	
	Deliver	scoop	\$ 1.00	6.00	\$ 6.00	
	8-way	cc	\$ 0.34	1.00	\$ 0.34	
	MUSE	cc	\$ 1.35	1.00	\$ 1.35	
	Fuel	gallon	\$ 4.00	1.15	\$ 4.58	
	General Supplies	enterprise			\$ 3.66	
	Utilities	enterprise			\$ 4.01	
	Subtotal Operating Costs					\$ 32.94
	Total Variable Costs					\$ 239.79
Fixed Costs						
	Death Losses	enterprise	5%		\$ 22.10	
	Equipment	enterprise			\$ 4.17	
	Corrals and Facilities	enterprise			\$ 3.33	
	Taxes	enterprise			\$ 5.55	
	Insurance	enterprise			\$ 4.01	
	Total Fixed Costs					\$ 39.16
	Total Costs					\$ 278.95
	Transfer Value Out					\$ 358.95

Weaning to Six Months

Walker Dairy Replacement Heifer Enterprise						
Weaning to 6 months						
					Three Month	
		Unit	Price	Quantity	Value	
Revenues						
	Transfer Value In			1		\$ 358.95
Variable Costs						
Feed						
	Grain	lbs	\$ 440.00	0.49	\$ 214.14	
	Hay	ton	\$ 230.00	0.05	\$ 11.27	
	Subtotal Feed Costs					\$ 225.41
Labor						
	Family	hour	\$ 15.00	1.78	\$ 26.67	
	Hired	hour	\$ 13.50	0.17	\$ 2.25	
	Subtotal Labor Costs					\$ 28.92
Operating Costs						
	Ivomec	dose	\$ 1.50	1.00	\$ 1.50	
	8-way	cc	\$ 0.34	1.00	\$ 0.34	
	MUSE	cc	\$ 1.35	1.00	\$ 1.35	
	Fuel	gallon	\$ 4.00	1.15	\$ 4.59	
	General Supplies	enterprise			\$ 3.67	
	Utilities	enterprise			\$ 4.01	
	Subtotal Operating Costs					\$ 15.46
	Total Variable Costs					\$ 269.79
Fixed Costs						
	Death Losses	enterprise			\$ 22.10	
	Equipment	enterprise			\$ 4.17	
	Corrals and Facilities	enterprise			\$ 3.33	
	Taxes	enterprise			\$ 5.55	
	Insurance	enterprise			\$ 4.01	
	Total Fixed Costs					\$ 39.16
	Total Costs					\$ 308.95
	Transfer Value Out					\$ 667.90

7 Months to 12 Months

Walker Dairy Replacement Heifer Enterprise						
7-12 months						
					Sx Month	
		Unit	Price	Quantity	Value	
Revenues						
	Transfer Value In	head		1		\$ 667.90
Variable Costs						
Feed						
	Pasture	acres	\$ 446.90	0.80	\$ 358.88	
	Grain	lbs	\$ 440.00	0.16	\$ 71.37	
	Hay	ton	\$ 230.00	0.02	\$ 5.63	
	Subtotal Feed Costs					\$ 435.88
Labor						
	Family	hour	\$ 15.00	0.89	\$ 13.33	
	Subtotal Labor Costs					\$ 13.33
Operating Costs						
	Ivomec	dose	\$ 1.50	1.00	\$ 1.50	
	8-way	cc	\$ 0.34	1.00	\$ 0.34	
	MUSE	cc	\$ 1.35	1.00	\$ 1.35	
	Fuel	gallon	\$ 4.00	2.29	\$ 9.17	
	Irrigation	enterprise			\$ 5.44	
	General Supplies	enterprise			\$ 7.33	
	Utilities	enterprise			\$ 8.02	
	Subtotal Operating Costs					\$ 33.15
	Total Variable Costs					\$ 482.36
Fixed Costs						
	Death Losses	enterprise			\$ 22.10	
	Equipment	enterprise			\$ 8.75	
	Corrals and Facilities	enterprise			\$ 7.00	
	Taxes	enterprise			\$ 9.92	
	Insurance	enterprise			\$ 8.47	
	Total Fixed Costs					\$ 56.24
	Total Costs					\$ 538.60
	Transfer Value Out					\$1,206.50

13 Months to 24 Months

Walker Dairy Replacement Heifer Enterprise						
13 months, breeding, to freshening						
			Unit	Price	Quantity	12 month Value
Revenues						
	Transfer Value In	head			1	\$ 1,206.50
Variable Costs						
Feed						
	Pasture	acres	\$ 446.90	0.95	\$ 426.67	
	Dry Cow Hay	ton	\$ 37.50	0.60	\$ 22.50	
	Subtotal Feed Costs					\$ 449.17
Labor						
	Family	hour	\$ 15.00	0.89	\$ 13.33	
	Subtotal Labor Costs					\$ 13.33
Operating Costs						
	Ivomec	dose	\$ 1.50	1.00	\$ 1.50	
	8-way	cc	\$ 0.34	1.00	\$ 0.34	
	Breeding	pregnancy	\$ 33.33	1.00	\$ 33.33	
	Fuel	gallon	\$ 4.00	4.59	\$ 18.34	
	Irrigation	enterprise			\$ 10.56	
	General Supplies	enterprise			\$ 14.67	
	Utilities	enterprise			\$ 16.05	
	Subtotal Operating Costs					\$ 94.79
	Total Variable Costs					\$ 557.29
Fixed Costs						
	Death Losses	enterprise			\$ 22.00	
	Equipment	enterprise			\$ 16.65	
	Corrals and Facilities	enterprise			\$ 13.34	
	Taxes	enterprise			\$ 22.22	
	Insurance	enterprise			\$ 16.05	
	Total Fixed Costs					\$ 90.26
	Total Costs					\$ 647.55
	Transfer Value Out					\$ 1,854.05