



# Agribusiness Finance Report

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## HEIFER REPLACEMENT: A DECISION TOOL TO DETERMINE IF IT IS MORE ECONOMICAL TO BUY OR RAISE YOUR OWN REPLACEMENT HEIFERS

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### Introduction

In the production cycle of a cow-calf enterprise, the producer will face the decision of replacing their older cows. The producer deciding to replace older cows with heifers has the following options: raise their own replacement heifers, buy open heifers and breed them, or buy bred heifers. The options vary in price, timing, and expense. The tool created is a cost-effective analysis between the three options: buying bred, buying open, or raising their own heifers.

### Tool

The tool created is a combination of questions and budgets. The producer will begin this tool by answering a series of questions about their operation. Responses from the questions will automatically generate the Enterprise Budget, Partial Budgets and results. There is a Reference tab that allows the producer to access current market information links. There are some considerations and assumptions that were made in the creation of this tool.

### Outside Considerations & Assumptions

There were certain aspects of the cattle operation that were not able to be quantified in this tool that the individual producer should consider when making their final decision based on the results of the tool.

Genetics were not included because the individual producer could be biased regarding their current farm genetics which could skew the results. However, the individual producer should consider whether the retention of their personal genetics or the introduction of newer genetics will change the results the tool provides for their individual farm.

Tax implications to the individual producer were not included in the tool. The producer should consider how depreciation and capital gains of breeding cattle affect their taxes. Including these considerations in conjunction with the estimates generated from the tool is recommended.

To simplify the tool it was assumed all capital purchases would be the same for all available options in the tool. Specifically, it was assumed the producer already had all of the necessary facilities and equipment to operate. This tool is not intended to evaluate new start-ups.

### Directions

Upon opening the tool in excel, the producer will find directions to help guide them. This tab explains the assumptions and the color coding used within the tool. For example, there are sections within the tool that the producer should fill out and sections that the producer can leave blank depending on the options the producer chooses.

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This project was completed as part of the Premier Farm Credit Student Board of Directors. This tool is available for all to use, but was developed in conjunction with Premier Farm Credit for use by their lenders and clients.

## **Intro Questions**

The Introduction Questions Tab is the most important tab to be completed for the successful use of the tool. The questions are divided into 3 sections: operation, feed cost, and other cost questions. The Schedule F is included in addition to other resources to help guide the producer.

### Operation Questions

The Operation Questions responses are needed to ensure the time period used for the model calculations is accurate. This tool follows the heifer from the point of purchase to calving. For a raised heifer operation, the operator should consider the age they would buy the heifer calf from a calf herd to raise for breeding. This may be a longer timeframe, which is why the producer should include a cost value for that heifer to be used in the tool. The objective of this tool is to quantify all of the costs associated with all 3 options. It does not consider the profit or revenue from the calf produced by the heifer. The more accurate the producer can be on the number of days on feed, pasture, and the projected prices the more accurate the results.

### Feed Costs

There are four ways the producer can choose to enter feed cost information: (1) total yearly quantity, (2) quantity per head per day, (3) total yearly costs, and (4) cost per head per day. The producer should select the option that they use most often to collect their cost information. The (1) total yearly quantity and (3) total yearly costs are based on the yearly costs of the producer's total cow herd. The numbers are divided by the days on feed and days on pasture for the cows, which is answered in the Operation Questions Section. The assumption is made that the cows and the heifers are not treated differently. The tool will calculate per head costs based on the herd size. The (2) quantity per head per day and (4) cost per head per day are provided so that the producer can calculate the results based off current market prices or future prices instead of the past prices.

### Other Costs

Other costs are based on the total (herd) costs. A producer typically does not calculate their per head costs for machinery and equipment. The personal operator can choose to use the numbers from their Schedule F or use estimates they feel are more appropriate for the equipment. The Breeding costs sections should be answered by the producer managing the herd to capture the costs of breeding open or raised heifers.

The breed-up rate prediction is based on the accuracy of the producer. If the actual percentage is lower, then the producer will have to absorb the cost.

## **Enterprise Budget**

The enterprise budget is used to project the revenues and costs for the individual heifer for the various options. The more accurate the producer was on the timeframe and the costs, the more accurate the enterprise budget. The information populated in the enterprise is based on the questions answered on the intro questions page and the timeframe reported. The uniqueness of this tool is the fact that it creates an enterprise budget for each possible enterprise, and will calculate the return above management for comparison purposes.

## **Partial Budgets**

The partial budget considers the costs and revenues that occur between two enterprises. Specifically, the partial budget calculates the change in profit resulting from considering only the revenues and expenses that change between the two enterprise options that are compared. This information is automatically populated from the intro questions and the enterprise budget. The value of these results is the comparison of what the producer currently does compared to the other two options. The partial budget considers all heifers, which means the income that is earned by selling raised heifers in order to acquire bred or open heifers is considered in the calculations. The producer will need to determine the appropriate partial budget comparisons based on their current operation practices.

## **Results**

The results tab focuses on condensing and synthesizing the information calculated in the previous excel worksheets. If the producer would rather read the results first, after they have answered the introduction questions, the answers will be populated. The first section of the results tab focuses on the results from the Enterprise budgets. The tool will automatically highlight the highest total revenue, lowest total cost, and best returns above management.

The second section in the results tab show the results of the partial budgets. The producer should look at the section that is considering the practice that they currently do. This will highlight the best alternative to their current practice. After the producer has studied the results, we recommend they proceed to the sensitivity analysis.

The third section in the results tab, sensitivity analysis, considers the effect of an increase or decrease of the purchase price of the heifers as well as the feed costs.

These are the largest costs on a heifer enterprise. The producer can take an answer from the partial budget result and the sensitivity analysis to determine the most appropriate decision for their operation. For example, if the producer believes there will be a possibility of a 10% increase in the cost of a bred heifer. They can consider the change in the base level and the number of the replacement heifers they are looking at acquiring. If the 10% increase cancels the net change in profit, the producer will mostly like opt to not do that option.

## References

The references tab provides the producer with a list of websites to view current input market prices. This is a tab provides clarity on the assumptions used in the tool as well as provides the producer with a way to collect additional information to personalize the tool to their operation.

### Broken Desert Enterprises - Heifer Replacement Example

Broken Desert Enterprises is a commercial cow/calf operation focused on producing beef cattle. They own 100 head of mature breeding cows as well as land and facilities to operate. Cattle are managed on pasture during the grazing period and fed hay, corn and silage during non-grazing winter months. Jim Sharpe, the manager of Broken Desert Enterprises, usually sells heifers and steers in the fall between October and November and generally raises and breeds 20 replacement heifers. Jim's calving season is between February 1<sup>st</sup> and April 20<sup>th</sup>. This year, Jim wants to compare his replacement options to decide if he should continue raising replacements, or if he should buy replacement heifers

When buying bred heifers, the producer will sell all the calves after weaning (\$780/head), and purchase 20 head bred heifers on October 1st at \$1,600/head. The heifers will be on pasture for 60 days and on feed for 60 days before calving (4 months from purchase to calving).

When buying open heifers, the producer will sell all the calves after weaning (\$780/head), and purchase 20 head open replacement females on January 20<sup>th</sup> at \$1,100/head to then be bred in May. These heifers will be on pasture for 160 days, and on feed for 240 days (13 months from purchase to calving).

When raising and breeding heifers, the producer will keep 20 heifer calves in the fall, and develop and breed these females to serve as the herd replacements. The heifer will be purchased for the individual's enterprise so a projected costs of raising the heifer to weaning should be valued (\$200/head). After the 20 heifers are selected after weaning they will be on pasture for 160 days and on feed for 330 days (16 Months weaning to calving).

The feed costs that Jim must pay, include acres grazed, hay fed, corn fed, salt, vitamins & minerals.

For the acres grazed, Jim has 250 acres at \$1.15/head/day. The total costs for the herd of 100 cows for 160 days of grazing is 160 days. With hay fed, the cows will eat about 1.5 tons at \$100.00 for 205 days grazed equaling \$12,812.60. For corn fed, the cows will eat 2 lbs of corn per day for 205 days at \$3.60 a bushel for a total of \$2,635.56. The salt, vitamins, and minerals at 0.25 lbs per head per day at \$0.80/lb for 365 for a total of \$7,300.00.

## Intro Questions Fillable Example

Below is the example of how the producer would fill out the Introduction Questions based on the information provided. However, the producer does not need to fill out all the sections on the feed costs. They only need to fill out one of the four options.

## Operation Question

Questions		
	Example	Units
Total Operation Size	100	head
Number of Possible Replacement Heifers	20	head
Length of Time for Raising a Bred Heifer (Weaning to Calving)	16	Months
Time from Purchase of Open Heifer to Calving	13	Months
Time from Purchase of Bred Heifer to Calving	4	Months

	Bred Heifer(from purchase to calving)	Open Heifer (From purchase to Calving)	Raised Heifer (From weaning to Calving)	Yearly Average Herd Days
Days on Feed	60	240	330	205
Days on Pasture	60	160	160	160

Projected Costs of Raising Heifer Calf to Weaning	\$200	\$/Head
Projected Purchase Price of Open Replacement Heifer	\$1,100	\$/Head
Projected Purchase Price of Bred Heifer	\$1,600	\$/Head
Projected Sale Price of Weaned Heifer Calf	\$780	\$/Head
Projected Transportation Cost Purchased Replacement Heifers	\$100	Totals
Interest Rate	5.00%	Percentage
What Type of Expense Information do you have?	Total Yearly Cost	<-- Click (This is where you get to choose the feed cost option you want)

## Costs Questions

*\*The producer selected Total Yearly Costs above, as a result the Total Yearly Costs is the section the producer must fill out. The answers must be in the total yearly herd costs.*

Feed Cost	Total Yearly Quantity	Unit	Price per Unit	or	Quantity Per Head per day	Unit	Price per Unit	or	Total Yearly Cost	or	Cost per Head per day
Acres Grazed	250	Acres	\$73.60		1	Acres	\$1.15		\$18,400.00		\$1.15
Hay fed	128	Tons	\$100.00		0.00625	Tons	\$100.00		\$12,812.50		\$0.63
Corn Fed	732	BU	\$3.60		0.0357	BU	\$3.60		\$2,635.56		\$0.13
Modified Distillers Grain Fed	0	Tons	\$-		0	Tons	\$-		\$-		\$-
Corn Stalks fed	0	Tons	\$-		0	Tons	\$-		\$-		\$-
Corn Stalks grazed	0	Acres	\$-		0	Acres	\$-		\$-		\$-
Corn Silage Fed	0	Tons	\$-		0	Tons	\$-		\$-		\$-
Salt, Vitamins, and Minerals Fed	9125	LBS	\$0.80		0.25	LBS	\$0.80		\$7,300.00		\$0.20
Other Feed Costs	0		\$-		0		\$-		\$-		\$-
Schedule F Feed Costs	0		\$-		0		\$-		\$-		\$-
Vet & Health Costs (Schedule F line 31)	0	Yearly	\$-		0	Yearly	\$-		\$-		\$-

Other Costs	Total Cost Example	Unit	Schedule F
Machinery (Expenses), Equipment, Fuel & Repairs	\$3,300.00	Yearly	Line 10+13+19+25 here
Pasture Upkeep Cost (fertilizer)	\$-	Acres	Line 17 here
Marketing, Transportation, and Misc. Costs	\$800.00	Yearly	Line 18 + 28 here
Other Costs	\$-	Yearly	Line 32 here
Spent on Labor	\$6,240.00	Yearly	Line 22 here
Insurance on Breeding Herd	\$2,000.00	Yearly	Line 20 here
Housing and Utilities	\$4,800.00	Yearly	Line 30 here
Machinery (Rent/Lease), Equipment, and Fences	\$-	Yearly	Line 24a here
Expected Conception Rate	95%	%	
Death Loss percentage	5%	%	
Breeding Cost	\$-	Total Per Head	
AI Costs (7 Day Co-Sync & CIDR)	or		
Drugs	\$6.25	Per Head	
CIDR	\$10.00	Per Head	
Semen	\$20.00	Per Head	
Arm Service	\$10.00	Per Head	
Mileage Charge	\$0.53	Per Head	
	\$46.78	Total Per Head	
OR			
Bull Costs			
Purchase Price of Bull	\$4,500.00	Per Head	
Salvage Value	\$1,800.00	Per Head	
Years of Service	\$5.00	Per Head	
Yearly Feed Estimate	\$500.00	Per Head	
Yearly Vet Costs	\$100.00	Per Head	
Heifers Covered per Year	\$20.00	Per Head	
	\$56.46	Total per head	