

A STUDY ON THE FEASIBILITY OF IMPLEMENTING A REPLACEMENT
HEIFER ENTERPRISE

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Abstract

This paper is a feasibility study on the implementation of a replacement heifer enterprise for Super Cattle Company. The problem set forth to be solved was finding a way to implement an enterprise with the least cost possible. This study focused on purchasing culled dairy heifers in the most cost efficient way, and to bred back the heifers and sell them as bred dairy replacements in California. The objectives were set to find all fixed and variable cost associated with producing a replacement heifer as well as determine if there was a market for these heifers in California.

The research methods that were used contain a detailed fixed and variable cost analysis to ensure that everything needed to produce a replacement heifer would be accounted for. It was also necessary to find a demand for the replacement heifers in the California market along with a break even analysis for the total costs of the enterprise. This was done to ensure that even if the replacements did not get breed back, SCC could hopefully still make a profit. It was also important to create a balance sheet comparing the expected cost with the expected revenues from the sale of the replacements.

After conducting the study it was found that SCC could make a profit of \$77,422.16 after the first year of implementing a replacement heifer enterprise. SCC also discover that they could still profit \$110 per head even if the heifers did not bred back and therefore had to be sent to the beef market. It was also found that there is a 30% increase in demand for dairy replacements in the state of California for 2010.

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Chapter 1

INTRODUCTION

Super Cattle Company has been in operation since 2004 as a cattle purchasing station of dairy cull cows. A cull is a cow that is being pulled from the dairy herd due to sickness, low production, or age. Currently Super Cattle Co. processes about three hundred head of cattle through their operation per week. This entails the hauling, weighing, tagging, grading, sorting, and feeding of the cattle. Super Cattle Co. has a contract with the processing plants in both Nampa, Idaho and Fresno, California, which pay for all of the hauling of the cattle after they have been weighed, tagged, and bought by Super Cattle Co. The cattle are then sold on a cents per pound basis to the processing plant.

Although their current operation has proven to be very successful, Super Cattle Co. would like to expand its operation. The company has just moved to a new location that is closer to all of their dairies and has ten times the holding capacity than that of the old buying station. The company is now looking for a new venture, such as a replacement heifer operation. With the extra holding capacity, Super Cattle Co. is looking to build a heard of replacement heifer for dairies that come from culled heifers purchased from dairies. Super Cattle Co. is looking to take the top quality culls and separate them from the beef pen in order to breed them back as dairy replacements. Once this takes place the heifers would then be fed by Super Cattle Co. and sold back to Dairies through a sales yard as replacement heifers.

Super Cattle Co. is interested in efficiently breeding back culls at a lower cost than if the dairies in the area were to do it themselves. The company is also looking into less expensive ways to feed the culls in order to cut costs. This may be done by feeding byproducts as a supplement for grass feed and alfalfa hay. These could include grape skins, almond hulls, and corn silage left over from ear corn production.

Problem Statement

To find an economically feasible way to purchase cull cows from dairies to then be bred back and sold as replacement dairy heifers.

Hypothesis

By purchasing culled dairy cows from existing dairies for \$200 - \$500 per head to provide feed, care, and quality bulls for reproduction, will the enterprise be able to market the bred heifers as dairy herd replacements for a profit?

Objectives

- 1) Find and compare beef prices against the price paid for a replacement dairy heifer.
- 2) To discover the cost of purchasing a herd of replacement heifers from culled cows.
- 3) To determine if it is financially possible to maintain a herd of replacement heifers at a reasonable cost to maintain a profit after they are sold as replacement heifers.

Justification

The people who will gain knowledge from this study are the employees of any company looking to implement a dairy replacement heifer enterprise. This study will also affect businesses in the area associated with replacement heifer production, due to the increased number of replacements entering the market. These include feed producers,

dairies, hauler, and processing plants. The replacement heifer industry could also be affected by creating an increase in the number of replacements being produced in the area. This increase in numbers could lead to a price change, and affect the entire replacement heifer market. If the replacement heifer enterprise is to be implemented, the company would likely need to hire someone to feed and care for the new heard of replacements. This could affect how the business is run and could create some tension between the employees. This enterprise could also take money away from the existing cull operation and significantly add more monthly costs for feed and equipment.

Chapter 2

LITERATURE REVIEW

With the current situation of the dairy industry, many dairies are looking for ways to cut costs and redeem some cash for their assets. With most dairies, the majority of their assets lie within their herd of cows. This means that like other companies, they can sell off some of their assets and turn them into cash. After the dairies remove one of their cows and cash in on that asset, they lose potential profit from that cow on the milking line. This means that they need to introduce another cow into their herd and replace the culled cow to be able to maximize their milk production. Another way these dairies can cut costs is by dropping their replacement heifer enterprise and purchase replacements from an off farm source. Because of this problem, Super Cattle Company is looking to enter the replacement heifer market.

Since Super Cattle Company is already in the cull cow business, meaning that they purchase culled cows directly from dairies and then sell the culls directly to beef processing plants. Currently SCC buys and sells almost eleven thousand head a year. Because there are so many cows going through their buying station, SCC is looking to keep the top culls and separate them from the beef market. Instead of sending the culls to be processed, SCC would like to breed them back and sell them as replacement heifers after holding them for about six to seven months. By doing so SCC is looking to benefit both from the sale of culls which they are already doing, and break into the replacement market as well. Because SCC is processing almost eleven thousand head per year, there is now a need to replace those culls with cows ready to enter the milking herd.

By looking into different reasons why a dairy cow is culled, one can better predict the number of culls which will be in the market, as well as the number of replacements that are needed. This is beneficial to know because one can then predict the market based factors that may increase cull rates, such as feed prices, milk prices, beef prices, and climate. All of these are outside factors and can be seen by everyone on the open market. For instance, if there were a rise in feed prices, dairies might be more inclined to cull their older cattle, which may need more inputs and replace them with a younger hardier cow that uses fewer inputs. Another example lies within the amount of cows that are culled from the average herd each year. If one can see that the average dairy in the United States culls 15-30% of their herd (Little, 2002), each year, SCC can better predict the numbers that will be coming in and plan accordingly with shipping to the processing plant.

Another way others have previously looked at culling rates is by creating a certain benchmark of milk production that is expected from each cow. This is seen in the “Dynamic Programming of the Dairy Cow Replacement Problem,” by Blair J. Smith. Smith’s research shows that cattle are looked at as a spot in the milking line, meaning they are more like a number. If one cow isn’t reaching the expected milk production level she is then culled from the herd and replaced. Smith shows numerical analysis which compares inputs, costs, and lactation cycles to see if there is any reason why the cow should be culled.

Howard and Schumway, (1988) have taken their research and come up with a formula that shows a genetic time table, that assess the cow and her importance to the herd. This allows the dairy to see if she is worth keeping or if it financially better by

culling the cow. Their research looks into the price of feed, stages in the lactation cycle, number of lactations, and calves produced. All of this is then assessed to provide a decision on whether or not the cow stays on the milking line.

Schnitkey (1989) does this by treating each cow as a depreciating asset; much like companies do for machinery, trucks, and buildings. Because they can be seen as a depreciating asset, dairies can use this to their advantage and earn tax breaks. Because of this, some dairies might be more inclined to cull more cows at both the end of each quarter and at the end of the calendar year to gain an advantage on their taxes and help with their accounting. It is an advantage to know this information to better prepare the business for the increased supply of culls and the increased demand for replacements.

Once the top culls are selected and separated from the beef pen, SCC needs to look at the costs of producing dairy cow replacements. In her journal article, Miller talks about the ways to cut costs in production. Much of this includes finding quality cattle which can easily maintain their weight under the conditions they are being raised. This means that it is up to the rancher to specifically select the genetics that will make for the most productive cow. Another way to do this is by cutting cost on feed.

The feed strategy that stood out came from the work of Jerry Newfeld, (1953). In his article, Newfeld looks at the use of agriculture byproducts as supplemental food, specifically almond hulls. It is a way to cut cost while still allowing the animal to gain its necessary nutrients.

Chapter 3

METHODOLOGY

Procedures for Data Collection:

It is necessary to survey companies in the industry located near Super Cattle Co. in order to determine the market need for purchasing replacement heifers. The companies that will be interviewed are targeted for their knowledge and importance in the area. These companies will be evaluated to define the key market for a replacement heifer enterprise. It is very important to interview the owner and operator of Savage Cattle Co., Bob Grempe. This would be very beneficial because Grempe has useful knowledge of the dairy industry in the area, and insight on replacement heifer opportunities.

Acquiring a six year price cycle of both beef and milk prices will be very necessary to the project. The six year cycle will be composed of a three year history and a three year forecast for both milk and beef prices. This information will greatly influence business decisions and serve as a way to see if historic records and forecasts can be used to predict future demand for replacement heifers.

Next it will be very helpful to research dairy cull rates on a quarterly basis near Super Cattle Co. and the surrounding Boise area. It is known, that the average cull rate is twenty five to thirty percent. However, the area around SCC needs to be assessed to see if this percentage is correct for the area. The next data needed is the costs associated with purchasing and raising a replacement heifer operation. These costs will include rent,

feed, transportations, bulls, and operation costs. If this can be narrowed down to accurate predictions, one can better determine the initial investment and maintenance costs of the enterprise.

Price comparison will also need to be conducted to see if it will be financially feasible to produce replacement heifers. This being said, SCC will need to compare its costs against the costs dairies have when producing their own replacements. If the comparison shows a lower price for SCC, it will be important to look for ways to implement a heifer replacement program.

Procedures for Data Analysis:

The first step, evaluate all relevant data of start-up and input costs for Savage Cattle Co. to produce a replacement heifer. This would be to done to make sure that Super Cattle Co. can afford to purchase a heard of culled cows. This section would be broken down into many different costs including, feed, rent, price per head, vaccinations, transportation costs, etc. All of this information will be broken down and shown in a table and balance sheet provided in the appendix. Also both the variable and fixed cost will be assessed and shown in a financial statement.

The next step is to evaluate market prices for replacements, along with the dairies demand for replacement heifers to predict the sale price for a Super Cattle Co. replacement heifer. This will give Super Cattle Co. an opportunity to find the market rate for a replacement heifer and look to beat that price by lowering their input costs. The third step is to evaluate all relevant information to show the average cost for a dairy to produce replacement heifer themselves versus the cost of purchasing one from Savage

Cattle Co. This would give Super Cattle Co. a better understanding of whether there would be a higher demand for their replacements because they could be produced at a lower price, and without the hassle of dairymen producing their own.

Next, all of the data based on both milk and beef prices need to be evaluated, this will be done using comparative graphs. Then both the high and low prices of both beef and milk need to be compared to the culling rates of the dairies. Completing this will allow one to see if there is a correlation between the three, making it easier to predict what the demand is for both culled cow and replacement heifers.

Finally, with all of the data analyzed, Super Cattle Co. will look to make a decision as to whether they can afford to add this enterprise to their operation and make a profit. Super Cattle Co. will need to decide how much money they would like to devote to this operation as well as what size herd they want to support. Once that is completed all that is left is to do is implement the plan.

Assumptions

Bearing a stable economy and relatively little variation in feed prices one should be able to make a replacement heifer enterprise feasible for implementation. Although there are many price fluctuations in both the beef and milk market, one should be able to make this enterprise feasible. Currently there seems to be no reason why this enterprise should not make a profit within its first two to three one hundred and fifty day cycles.

Chapter 4

DEVELOPMENT OF THE STUDY

As stated before in chapter three, the first piece of information that would be needed is an interview with a company in the cattle industry, in close proximity to Super Cattle Co. The Company that was selected is Savage Cattle Company. This company was chosen because they play a key roll in the dairy cull industry located near Super Cattle Co. Bob Grempp, who is the owner and operator of Savage Cattle Company was interviewed and gave great insight to the number off cattle in the valley as well as how many cows are culled each year. Grempp stated that there are roughly fifty-thousand head of milk cows in the Treasure Valley (target location), with close to fourteen-thousand head culled each year. By doing the math one can see that there is an estimated twenty-eight percent cull rate in the area. Going back to chapter 2, we can see that this correlates to Little's study, where he stated there is typically a fifteen to thirty percent cull rate. Because the treasure valley sits closer to the high side of culling rates we can be sure that there is always a constant demand for replacement heifers.

Another key piece of information retained from Grempp was the initial costs for purchasing a culled heifer and the carrying costs associated with holding the animals until they are bred back. After looking at that information it was determined that specific costs would be allocated as fixed and variable costs. The fixed costs included rent, equipment maintenance, operation costs, salary, office supplies, phones, registration, insurance, and the flat cost of purchasing a heifer. The variable costs include hauling, hay/straw, fuel, brand inspection, farm supplies, and medical needs. They can be seen in Table 1.

Super Cattle Co. Replacement Heifer Enterprise

Fixed Costs

	Total	Per head	# of Head
Rent	\$ 6,000.00	\$ 30.00	200
Equipment			
Maint.	\$ 7,544.00	\$ 37.72	200
Operation Costs	\$ 1,500.00	\$ 7.50	200
Salary	\$ 15,000.00	\$ 75.00	200
Office Supplies	\$ 102.00	\$ 0.51	200
Sprint	\$ 1,895.00	\$ 9.48	200
Quest	\$ 871.00	\$ 4.36	200
Registration	\$ 1,781.00	\$ 8.91	200
State Farm	\$ 189.00	\$ 0.95	200
Geico	\$ 985.00	\$ 4.93	200
Cows	\$ 70,000.00	\$ 350.00	200
Total	\$ 105,876.00	\$ 529.34	

Variable Cost	Total	Total Measure	Per Head	# of Head	
Hauling	\$ 2,000.00		\$ 10.00	200	
Brand Inspection	\$ 500.00		\$ 2.50	200	
Farm Supply	\$ 1,200.00		\$ 6.00	200	
Heard Health	\$ 160.00		\$ 0.80	200	
	Unit	Amount	Total	Per Head	# of Head
Hay/Straw	Tons	\$36,000.00	360	1.8 Ton	200
Fuel	Gal.	\$ 1,900.00	655	3.2 gal	200
Total		\$41,760.00		\$ 208.80	
				Per Head	# of Head
Fixed cost			\$ 105,876.00	\$ 529.38	200
Variable Cost			\$ 41,760.00	\$ 208.80	200
Total Cost			\$ 147,636.00	\$ 738.18	200

Table 1

Now that both the variable and fixed costs are known it is time to move onto the expected market that Super Cattle Co. is looking to enter. The replacements heifers are

to be sold at the Farmers Livestock Market, operated by the Oakdale Livestock Auction Co. in Oakdale, California. This auction was selected because of its great reputation and the notion that the prices for replacements are higher in California than they are in Idaho. Although this may be true, it was also found that there currently are fewer dairy replacements in California than there were in 2009. With this being so, now is an opportune time to raise dairy replacement heifers and sell them in California because there are fewer being produced which leads to a higher demand. This is shown in Table 2.

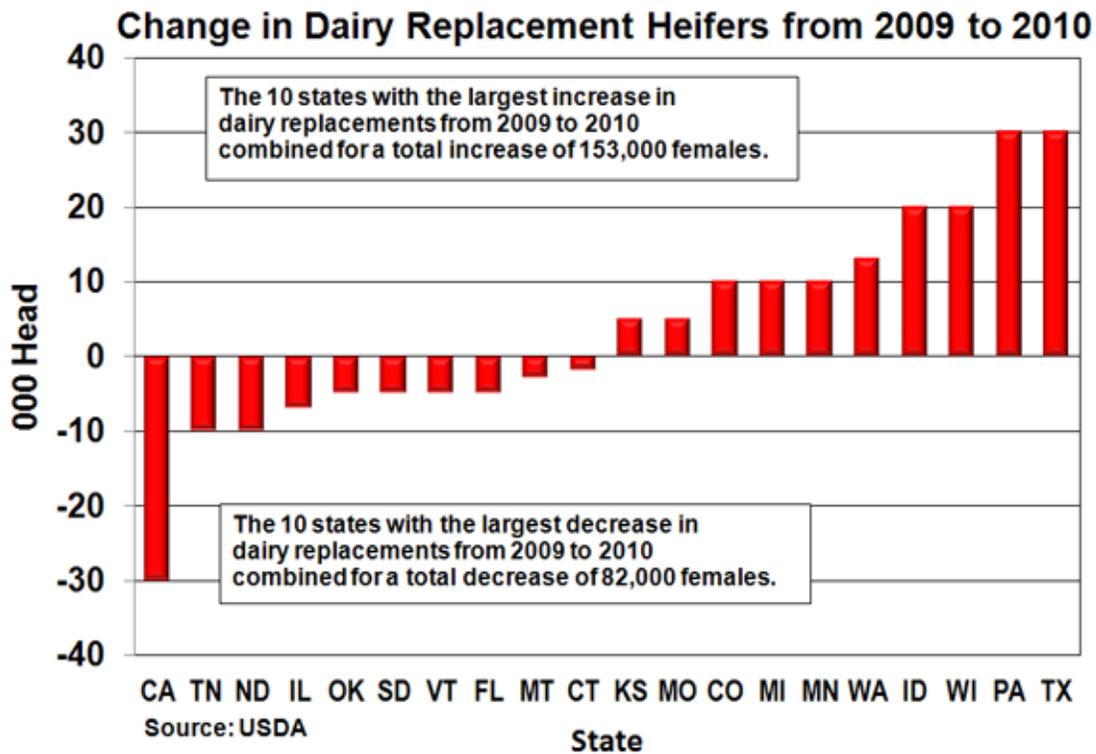


Table 2

With the price for a bred heifer in the western part of the United States listed at \$1150 a head, Super Cattle Co. is looking to take advantage of the high price.(The \$1150 price comes from the January 2010 averages as listed in Cattle Fax). Super Cattle Co.

expects to make a profit after its first year based on the assumption the there revenues and costs remain relatively stable. They can be seen in Table 3.

Replacement Heifer Sales minus Expenses

Sales for first 150 days

	Total	Per Head	# of Head
Total Revenue after sale	\$115,000.00	\$1,150.00	100
Expenses	\$ 73,818.00	\$ 738.18	100
Net profit before tax	\$ 41,182.00	\$ 411.82	100
Tax rate	6%	6%	
Net profit After tax	\$ 38,711.08	\$ 387.11	100

Sales for Second 150 Days

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Net profit After tax	\$ 38,711.08	\$ 387.11	100

Profit

Total Profit after first year	\$ 77,422.16
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Table 3

As listed earlier, Super Cattle Co. will choose to operate its replacement heifer operation in two one-hundred and fifty day rotations containing one-hundred heifers each. This will be done to avoid crowding in the pens and to keep from being overwhelmed by the new enterprise. Super Cattle Co. is looking to hire someone to care and feed the heifers as they are bred back to be replacement heifers. This employee will

be paid a flat salary of fifteen-thousand dollars per one-hundred and fifty day cycle. Super Cattle Co. has also chosen to keep the rotations to one-hundred and fifty days so that the replacements can be sold as bred pairs in order to gain a higher price. This also allows for the dairies buying the cows from the sale to introduce the replacements to their new dairy and place them on a feed regiment.

In case any of the replacements do not take to the bulls to get bred or if they become sick, Super Cattle Co. plans on selling them to the beef market. According to Cattle Fax the current price for a live Holstein to be butchered is listed at sixty-four to sixty-five cents per pound. Figuring that the heifers average 1300 pounds Super Cattle Co. should get around \$845 for their replacement. When that number is compared to the total cost for producing a replacement heifer to be \$738.18, shown in Table 1. One can see that even if the replacement does not make it to the sale in Oakdale, Ca, Super Cattle Co should still make a profit of almost \$110. Super Cattle Co. is also looking to make sure the totals cost stay as close as possible to the estimated cost to ensure that the company has minimum risk, in case the company needs to remove a heifer from the bred heifer pen and send it to the beef market.

The heifers that will be selected will range in age between two and two and a half years of age. All of these will be heifers that either did not take to a bull at the dairy, or ones that had one calf and then were culled from the milking line. It is because of this reason that the heifers can be bought at such a low price. Although the dairies may not want to allocate any more resources to the heifer SCC believes that if they are young and healthy enough they can still be breed back. While the heifers are at Super Cattle Co. they will be put in pens with bulls and begin breeding. After the second month of the

heifers being at Super Cattle Co. they will have a pregnancy check to ensure that they are in fact pregnant. Once the veterinarian confirms a pregnancy the heifers are then put in the bred heifer pen and wait until they reach their one-hundred and fifty day maturity, before they are shipped to Oakdale, California to be sold as replacement heifers.

After conducting the research it was discovered that this new replacement heifer enterprise could be profitable for Super Cattle Co. if it is run correctly. The company will need to be sure to select the right heifers to be bred back and be sure to keep them feed and well taken care of for their one-hundred and fifty day cycle. Now the next step is to implement the plan and begin the enterprise.

Chapter 5

Summary

After conducting this study, it has been discovered that one can successfully implement a replacement heifer enterprise and make a profit; bearing that many of the factors in the study are relevant to current prices. This has come to a realization after the proper steps have been taken and the research has been completed. This study shows the necessary information needed to add a replacement heifer enterprise, and maintain its operation.

To begin the study it was important to set expectations for what was trying to be attained. In this case it was to find an economically feasible way to implement a replacement heifer enterprise into an existing business. To solve this problem it was of great importance to find out how SCC could build a herd or replacements with a little cost as possible. Once the research was completed it was found that the best way to attain a herd was to purchase culled dairy heifers ranging in age between 2-2 ½ years. It was also found that these culls could be bought for \$200-\$500.

The next step was to research the market to ensure that there is going to be a steady demand for one's product, in this case the product is a replacement heifer. Other market factors include hedging one's risk by finding a break even point for ones product. For this study it was found that the break even price for a replacement heifer is \$738.18. Since the break even point has been established, SCC now knows that it can still make a profit of \$110 even if their heifer does not get sold as a replacement. Because research

has found that the average beef price received for a Holstein heifer is \$845 with the average weight of 1300 lbs.

It was also necessary to complete a full start up cost analysis to ensure that it is economically feasible to implement a replacement heifer enterprise into a business. For this, all the variable and fixed costs were assessed and totaled to establish a benchmark income to be attained. Once all the costs were totaled, it was found that an initial investment of \$147,636 would be needed to start the enterprise. With that being know it was then necessary to find the market prices for replacement heifers. For this, the study turned to Cattle fax in search of market prices. It was found that the current going rate for a bred replacement heifer is \$1150. This brings the expected income to \$387.11 per head, and the total income to \$77,422.16 after expenses and taxes. Now that SCC knows its expected profit, the company can now begin to implement the plan of two 150 day cycles containing 100 head each.

Conclusions

Now that this study has proven that implementing a replacement heifer enterprise is both feasible and profitable, it is up to SCC to put the research into action. It is important to realize that after analyzing both costs and revenues, SCC would look to make a Profit of \$77,422.16 after the first year. SCC must also be aware that with an increased number of head, their profits would also increase. The research also proves that there is an increased demand for 30,000 head of replacement heifers in California for 2010. With that being know it is very important for SCC to begin their operation soon, to take advantage of the increased demand.

SCC must stay focused on this enterprise to be sure that all the heifers are cared for and breed back in order to reach maximum profits. Although SCC could still profit \$110 if the heifer has to enter the beef market, it would be much better for the growth of the company if SCC could reach the maximum expected profit of \$387.11 per head. SCC must also be sure to cull a heifer from their own herd if the heifer does not get bred or is she becomes sick and can't be treated. It is important that the heifer be sent to the beef market to ensure some profit for the company.

Recommendations

For anyone who is thinking about implementing a replacement heifer enterprise it is important to research market prices as well as market trends, and predictions to make sure the enterprise is worth the effort. It is also a necessity to list and price out all variable and fixed cost and then compare them with estimated revenues from market prices to be certain that the enterprise will make a profit. For this enterprise to be successful it is extremely important to find out a way to purchase heifers at a low price to keep the initial start up costs down and maximize profits. The study also suggests that one looks at keeping the expected cost on the high side and expected revenue forecasts low, and then create a balance sheet to find out the expected profit for the enterprise. If one wanted to extend the research effort even more, one could forecast a balance sheet not just for the first year but for another three to five years. This could be useful in learning the sustainability of the enterprise given forecasted market expectations.

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