Determine if Raising Holstein Steers Can be Profitable, While Creating a Quality Product.

A Senior Project

Presented to

the faculty of the Dairy Science Department

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Bachelor of Science

by

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Abstract

The objective of this experiment is to determine if holstein steers can be raised for a high quality, profitable beef product. The data collected came from Dyt Dairy and their steer program. Records came from the Souza Family, who does the calf raising for Dyt Dairy, and were compiled into a spread sheet. Daily costs incurred in raising a steer for the first five months were incorporated and analyzed relative to different rates of gain. The second stage analysis involved the next five months on a higher ration at Dyt Dairy #2. Again costs per day and rates of gain were calculated and compiled on a spread sheet. The final stage of the steer program was sending them to O.K. Cattle L.L.C. for finishing. With all the information compiled on a spread sheet, a cost analysis was performed on the performance of the holstein steers. The results showed that the holstein steers were profitable and provided an average income of $236.82 per head. This result came from an average rate of gain of 2.667 the first 135 days, 2.767 the next 150 days, and 3.517 the final 145 days. The weighted average of costs per day was $2.99, which included all costs. As a result Dyt Dairy will continue to raise holstein steers and look into expanding their holstein steer herd size.

Key Words: Holstein Steers, Rate of Gain, Dairy Farm
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Introduction

In recent years, the dairy industry has gone through tough economic times and experienced a loss in overall equity. With these tough economic times dairy farmers have looked for ways to diversify and create another source of income. A way to create another source of income is raising holstein steers. The market for holstein steers has risen in years past, with a greater chance of profitability. (Siemens) Holsteins are able to create a quality beef product and have become a big part of the beef market. (Cheatham and Duff) With the proper program in place, there is a real market available to create a steady flow of income for dairy farmers.

Holsteins are a viable choice for a beef program because of the small genetic variation within the holstein breed. (Zobell et al) This is one of the factors that has contributed to holsteins being one of the largest portions of breeds being used for beef. (Schaefer) With the proper program, dairy farms are able to raise a steer to 1200 pounds and have the steer grade Choice. This is a good target weight because the heavier the steer gets, the profit margin begins to diminish.

In order to make a steer grade choice at 1200 pounds, a good system has to be implemented with proper rations and good use of implants. If animals are raised from birth, a two implant system is the most popular, and seems to have the best results. (Cheatham and Duff) Besides implants, steers must be finished on a hot ration for them to reach a high grade such as Choice. This ration must be finely tuned in order to maximize the animals rate of gain and use of implants. There also must be an available market that will take the finished product, and close enough so the animal does not experience too much shrink. (Burdine et al)
The objective of this experiment is determine if it is cost productive to raise a quality holstein steer for beef.

**Literary Review**

**Holstein Steers**

Holstein steers serve as an integral part of the beef industry because they represent a large portion of animals that are slaughtered for beef. According to Schaefer, holsteins are the largest single breed contributor to the beef market. (Schaefer) The benefits of working with holstein steers are that they are a more uniform breed due to the high genetic concentration in the dairy industry. Morbidity and mortality rates are also lower in the holstein breed. A third point to be made about holstein steers is that they generally receive a higher marbling score than traditional beef breeds. This is because holsteins have to be older and heavier in order to reach a higher beef grade such as Choice. (Zobell et al) But because holsteins are brought to a higher overall weight, it is essential to pay attention to the rate of gains and make sure that they do not become too heavy. Feeding a heavy animal costs money and this will take away from profitability in the long run. Once the steers reach 1400 pounds, the rates of gain begin to diminish and the cost of feeding is disproportionately higher. (Burdine et al.)

**Creating a Steer Program**

When implementing a steer program, one very important factor that must be looked at is the animal’s rate of gain. A rate of gain is measured by the amount of pounds that the animal has gained over a period of time. When looking at the steer market it is usually compared by the amount of pounds that a steer gains in one day. The amount of energy needed for a holstein steer is about 10 to 12 percent higher than a traditional beef breed.
This means that they will need to consume a more concentrated ration in order to maintain a higher rate of gain. A good rate of gain for a holstein steer is about 3 pounds per day. A three pound per day rate of gain would require a 18 to 20 pound ration with appropriate protein and starch levels depending on the stage of the steer. As the animal gets bigger and closer to its finishing weight, it will need a higher and more concentrated ration in order to peak at a good weight with a high quality grade. It is critical to calculate how much it costs to feed your animal before it reaches 1100 pounds. At this stage the animal must be responding well to the ration in order to maintain a high rate of gain, and be cost productive.(Grant et al.)

When creating a steer program, there are different options of starting weights. Meaning you can raise the steer at certain stages if it is more cost productive. One example would be buying them at 500 pounds and then taking them to a finishing weight and grade. But when looking for maximizing profitability, and assuming it is within your means, it is best to raise the steer the whole way through, meaning from birth until slaughter. As stated one benefit of raising holsteins is that they tend to be uniform due to the genetics of the dairy industry. When steers are placed on an all grain diet at an early stage, it allows for the animal to gain weight quickly and efficiently. This should enable the steer to make choice grade at 1,050 to 1,200 pounds.(Grant et al.)

Creating a proper steer ration for holsteins is crucial. It is very important to get a good start for the calves because they need to be strong and healthy animals. According to Waldman et al., a calf will go through its biggest muscle growing stage after is has been weaned from the mother. So, you must pack the energy in the steer at a very young age.(Waldman et al.) Once the steer reaches 150 pounds, three common paths are taken.
There is a continuous all grain diet; pasture, followed by finishing concentrate diet; or a continuous high levels of corn silage. Here you want to look at what suits you more economically and if you can supply the feed yourself. An all grain diet will get the steer to reach a higher grade at a lower weight, maximizing profitability.

When creating a ration you must consider the effects that the steers will go through when put on a high concentrate ration for the last 400 days before they are slaughtered. You must be careful and not burn out the steer. (Grant et al.) A steer can develop a health disease called acidosis when put on too hot of a ration. According to Stock and Britton, it has become the most important nutritional disorder in feedlots today. Acidosis is caused by rations that contain too much starch in the diet. The most common grains that cause acidosis are dry rolled wheat and dry rolled barley. When these types of grain on put into a ration, you must ease the animals into it to develop their rumen. (Stock and Britton)

Once the steers start to feed on grain it is important that steers are grouped into lots, and should not be moved from their pen. Anytime that an animal is moved it’s stress level will rise because it must compete with it’s new peers, or in a new environment. When the animal goes through stress, it can go off feed, slowing the rate of gain, and this can be a possible cause of acidosis. This problem can be minimized by adding Rumensin™ to the ration. (Grant et al.)

**Implants**

The next step in implementing a program is selecting an implant program. According to Cheatham and Duff, there are over 24 different types of implants, and numerous types of implant strategies, and there is no strategy that is known to be the universal solution. There are over 24 different types of implants and each can develop certain areas of the steer. But it is known that implants are a definite benefit to a steer program.
things you want to get out of using an implant program are improving your rate of gain, increased marbling, increased feed efficiency and also protein deposition. (Cheatham)

According to Cheatham and Duff, 98 percent of all feed lot programs have some sort of implant program. Depending on how long the steers are on a feed ration will dictate how many implants are used in their lifetime. If animals are in higher stages, 66.8 percent only use one implant, about 30 percent use two implants, and about .4 percent use three or more implants. The study that they performed said that giving one implant to the steer increased the daily gain by over 26 percent. (Cheatham and Duff) This shows that including at least one implant will the greatest overall percent increase with the greatest response. When multiple implants are incorporated into the strategy, the feed efficiency of the steers will go up by another 10.9 percent. The programs that seem to work the best are the ones that start with one estrogen implant, followed by an implant with higher estrogen and high androgen levels. (Cheatham and Duff)

When steers in the first stage, or less than 500 pounds, a two implant system is more common. At this point 74 percent of the ranches will use a two implant system to maximize the rate of gain and feed efficiency. When implementing a two implant system, the first implant will be put in at about 200 days of age. Since implants are good for about 100 days, the next implant will be put in at 300 days and should last till the time of slaughter, about 400 days. Again this will maximize the rate of gain, feed efficiency and also Dry Matter Intake (DMI).

**Beef Grading**

The goal of implanting steers is to raise the steers to reach a choice grade. Choice grade is a grade of beef that is assigned by the United States Department of Agriculture to
determine the quality of the meat. These standards were created in 1996 and are called the “Standards for Grades of Slaughtered Cattle and Standards for Grades of Carcass.”(Tatum) There are two different grades that the U.S.D.A. can assign and they are a quality grade and a yield grade. The quality grading is assigned to show the eating characteristics of the meat such as flavor, tenderness, and juiciness. The eight grades are USDA Prime, Choice, Select, Standard, Commerce, Utility, Cutter, and Canner.(The highest being Prime and the lowest is Canner) The factors that go into the quality grade are marbling and maturity.(Tatum)

Maturity is based on 5 different grades, A through E, depending on how old the slaughtered animal is. An “A” is given to the animals that are slaughtered between 9 and 30 months, which is a sign for better quality. It is then followed by “B”-30 to 42 months, “C”- 42 to 72 months, “D”- 72 to 96 months, and then “E” which is more anything than 96 months. Then the meat is given a marbling score. Marbling is “the amount and distribution of intramuscular fat.”(Tatum) There are ten different marbling scores that are given to grade the beef. The next grade determined would be the yield grading which is the amount of beef that the carcass would give. It is based off a 5 stage system of “closely trimmed, boneless retail cuts.(CTBRC)” (Tatum)

Table 1. Relationship of Yield Grade to Percent Closely Trimmed Boneless Retail Cuts

<table>
<thead>
<tr>
<th>Yield Grade</th>
<th>%CTBRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>USDA Yield Grade 1</td>
<td>&gt;52.3</td>
</tr>
<tr>
<td>USDA Yield Grade 2</td>
<td>50.0 to 52.3</td>
</tr>
<tr>
<td>USDA Yield Grade 3</td>
<td>47.7 to 50.0</td>
</tr>
<tr>
<td>USDA Yield Grade 4</td>
<td>45.4 to 47.7</td>
</tr>
<tr>
<td>USDA Yield Grade 5</td>
<td>&lt;45.4</td>
</tr>
</tbody>
</table>

Beef Grading (Tatum)
Beef Market

When creating a holstein steer program, it is imperative to find out what kind of market you are in, and how close you are to it. There are two general markets that will be considered. One that is a traditional market in which you are using implants and allowed to use hormone and injection shots. Another option is one that is grass fed and has a more “natural” approach. When you find your market, then you can determine which one you can feed.

According to Burdine et al., in years past, the holstein breed has been viewed as a lower quality meat and has not been given the justice that it deserves. A study was done and it showed that it was a result of the blending of holstein meat with lower quality meats. In reality, holstein beef has very good quality and is known to be good beef. Ralph’s Grocery Company took notice to this quality and had created a program of holstein beef to supply their stores with holstein beef. They chose a holstein beef system because the cuts of meat are more consistent, tender, and have high yields. (Burdine et al.)

It is said that carcasses that are finished between the 1200 and 1400 pound range are better accepted in the market because the size of the cuts are more appealing to the customer. These cuts of beef are sold in boxes, and therefore these boxes of beef are the driving force of the market. The price of feeder cattle is also traded on the futures market, which has an impact on the current market as well. The last major impact, which has become a bigger impact in recent years with the production of ethanol, is the price of corn. (Burdine et al.)

According to Rinehart et al., there is a market for grass fed beef and the holstein responds well to a whole forage diet. Although there are some set back with maintaing
energy needs through cold periods, there is a great source for cheap feed and in turn a
high quality product. These cattle can reach the 1150 to 1300 pound mark, with a little
substitute of high and low quality alfalfa hay. There is a great opportunity if you can find
a niche market and sell directly to the consumers and restaurants. With an even greater
opportunity for profit if the beef can be certified organic. (Rinehart et al.)

When dealing with a niche market, there is a lot more marketing that has to be done.
If you market your product to the public, it can be as high as 25 cents per pound. But
when the specialty markets are available, the returns will come back. According to Jost,
consumers will pay more for good tasting, pesticide free, no growth hormones or
antibiotics, lean meat, and are looking to support local farming. These are all ways to
create added value to your beef and can really create the extra profit in sustainable
farming. (Jost)

Negatives

There are some factors that can affect the holstein steer more than a traditional beef
breed and put them at a disadvantage. This could be something as simple as a muddy or
sloppy corral, cold weather, or overcrowding. These conditions would have a direct set
back on the rates of gain for the steers and make them less profitable in the long run.
Since holsteins may not be as hearty, you want to make sure that they are properly cared
for and looked after. Another drawback that was stated by Burdine et al., was that
holstein beef still has a poorer quality connotation, and sometimes you will receive a
lower price for your meat. Another negative about holsteins steers is that they are hard to
feed up to a prime grading. There are a lot of feed costs and good management strategies
that go into getting holsteins to grade prime. It must also be noted that there must be a
market that is reasonably close. (Burdine et al.) There is also one factor that should be considered and that is manure. In some cases manure is an expense and must be incorporated into costs. But most areas, it is a benefit and can be used as a commodity for crops and farming.

**Materials And Methods.**

The bulk of the information for materials and methods will come from the Dyt Dairy steer program that is run on a Dairy Comp 305™ program. In Dairy Comp 305™, a steer program has been adapted to enter the birth date and/or purchase date, return date, finishing date, and also the weights after each stage. The birth date consists of the day that the steer was born and purchase date would be the purchase date from a calf ranch. The return date is the date in which the steer comes back to the Dyt Dairy after being at the calf raiser. And the finishing date is the date the steer is slaughtered. There is also an entry for the weights at the return from the calf ranch back to Dyt Dairy. Also the weight is recorded when the steers leave Dyt Dairy and move to OK Cattle L.L.C.. The data will be collected and averaged to see the total average cost of raising a holstein beef steer. Also the rates of gain will be calculated, and the cost of the rate of gain at each stage.

The program for the holstein steers that is in place is the holstein calves are born on Dyt Dairy #1. The bull calves are picked up in the morning or in the afternoon, and taken to the Souza farm. The calves will stay at the Souza farm for approximately five months, and then brought back to Dyt Dairy #2. The holstein steers will stay at Dyt Dairy #2 for five months and then brought to OK Cattle L.L.C.. The steers will stay at OK Cattle L.L.C. until they reach their finishing weight and be sold for slaughter. The finished steers are then sold to Bro Pack beef company.
Calf Raising Program

The calf raising is done by the Souza family in Chino, California. Once the calves are born, the calf is given a ear tag, and the date of birth is recorded. Before the calf leaves Dyt Dairy #1, it is given a colostrum replacement, and the naval is dipped with an iodine solution. The calves are picked up during one of two pickup times per day run by the Souza family. The data collected from the calf raising program will include data given by Frank Souza of how much it costs to raise a calf up to an average of 5 months. The costs for day to day operations is $2.10 per calf per day. Also, there are costs of implants and implementing the implants into the steer calves that are incorporated. Another cost that will be incorporated is the castration of the bull calf, making it a steer. The costs of calf death loss and the percentage of lost the calf needs to be incorporated. Also any miscellaneous costs are incorporated to get as close of a true costs as possible. The steers are then sent back to Dyt Dairy and processed there.

Program At Dyt Dairy

After the steers are at the Souza Farm, they come back to Dyt Dairy #2. At this stage the steers are weighed as a group, and the average weight is assigned to each steer in that group. When the steers come to Dyt Dairy #2, they are placed into one of three pens. One pen is worked on at a time, trying to fill each pen up to about 100 steers. The steers are grouped and do not move between pens. The goal of this is to try and keep the amount of stress as minimal as possible. The steers are fed a Total Mixed Ration(TMR), which includes manger clean out from the milking cows at Dyt Dairy #1. Manger clean out is the feed that is left over from the milking cows, compiled and added to the TMR for the steers.
The costs that will be incorporated at this stage will be the cost of the feed in the TMR. The hard part of assigned a cost to the TMR is the value of the manger clean out. It is a hard cost to assign because it is waste from the milk cows at the other dairy. For the purpose of this project, the value of the manger clean out will be the full costs of the feed ingredients. Other costs that incorporated at this stage are costs of vaccinations. And also possible hauling costs to and from Dyt Dairy. The final calculation from this stage will be the steer death loss. In order to get an accurate cost, you must incorporate the death loss and average the dollars lost into the program. This will be calculated by adding all costs incurred to the animal until this point.

**Program at OK Cattle L.L.C.**

The program at OK Cattle L.L.C. is to take the steers after the steers have been at Dyt Dairy and bring them to a finishing weight. The steers are approximately 10 months old at this point and are put on a hot ration. A hot ration is one that is focused on high concentrate feeds in the ration in order to make the steers put on the marled weight they need to gain to make grade. A highly concentrated ration usually consists of a lot of corn and/or barley. The ration that O.K. Cattle has put together consists of corn, molasses, Dried Distillers Grain (DDG), hay, and almond hulls. Again the goal of this ration is to bring the steers to finish at a Choice grade.

Once the steers arrive, they are processed and staged into a group pen. The pen is filled until there is about 100 steers in each pen. Once the steers are placed into a pen, they are not moved in order to limit the amount of stress put on the animal. This is done to improve the rate of gain. During the processing, the steers are recorded of entry date
and also average weight of the group. At this point the steers also receive an implant which should last close to the slaughtering date.

The steers are chosen to be slaughtered by the managers at OK Cattle. A group of about 20 animals are sold at one time, and sent to Bro Pack beef company. Here the animals are recorded of their final slaughtering weight, the yield of meat and also the grade. The steers then receive a price for the yield of meat. The processing and hauling costs are then deducted from this price and a check is sent to the owner of Dyt Dairy.

Results and Discussion

The results of the steer program at Dyt Dairy are broken down into three stages of calf raising at Souza Family farm, time spent at Dyt Dairy #2, and the finishing phase at OK Cattle L.L.C. At each stage rates of gain, costs per pound gained, number of days, and average weights were analyzed. The final results showed that the steer program is profitable and the steers are making high grades of beef.

Table 2:  Steer Results

<table>
<thead>
<tr>
<th></th>
<th>Sousa Family</th>
<th>Dyt Dairy #2</th>
<th>OK Cattle L.L.C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of Gain</td>
<td>2.66 lbs per day</td>
<td>2.77 lbs per day</td>
<td>3.52 lbs per day</td>
</tr>
<tr>
<td>Costs per Pound</td>
<td>$0.87</td>
<td>$0.99</td>
<td>$1.07</td>
</tr>
<tr>
<td>Avg. Weight</td>
<td>445</td>
<td>860</td>
<td>1370</td>
</tr>
<tr>
<td>Number of Days</td>
<td>135</td>
<td>150</td>
<td>145</td>
</tr>
</tbody>
</table>

(The results from this experiment were compiled on a spread sheet which can be seen in Appendix 1.)

The results of the calf raising program at Souza Family farm were better than expected. With an average gain of 2.66 pounds per day for the first 135 days, the calves are getting a good jump start to their weight gain. The cost at this stage is $2.10 per day per steer, this
includes most of the costs at this stage. (See appendix for other costs incurred) The total average cost for this stage is $311.41 per head. This is the cheapest portion of weight gain and cost per pound, essentially being the most cost productive stage. There is also a very low death loss at this stage. The average death loss for the calves is about 2 percent throughout the year. This includes a few calves who make it through the program alive, but are too sick to continue in the program. There is always room for improvement.

Moving forward, Dyt Dairy is looking into putting more energy into their calves to put them closer to a 3 pound per day average at this stage. This would cost more money for input, but would be returned in a greater weight gain.

The stage at Dyt Dairy #2 held an average weight gain of 2.77 pounds per day for an average of 150 days. With a higher rate of gain than the first stage, it is a good improvement but still expected. The feed costs per animal per day was $2.73. This price included 15 pounds of manger clean out, 3 pounds of bakery, 5 pounds of rolled corn, .25 pounds of Rumensin™ and supplements, and 6 pounds of citrus peel. It should be noted that this included the full costs of the manger clean out used at Dyt Dairy #1. It is tough to give a true value to this feed because it is contaminated feed that can not be used for anything else. The total costs incurred at this stage was $411.42. The average total weight of each steer after this stage was 860 pounds. Room for improvement could be done by increasing the rate of gain at this stage as well. The goal at this stage would be to make it above 3 pounds per day. This could be achieved by making a higher concentrated ration and changing the implant that is currently being used.

The average total costs at OK Cattle L.L.C. was $545.35, which accounts for an average of 145 days. The feed costs per day broke down to be $3.26, which was for 12.43 pounds.
of corn, 1.65 pounds of molasses, 3.74 pounds of DDG, 2.09 pounds of hay, and 2.09 pounds of almond hulls. These feed costs contributed to a 3.52 pound average rate of gain. This was a very satisfactory number, being well above the 3 pound a day average. Also included in the total costs was a $0.40 per day charge by OK Cattle for daily management fees. Other costs that were incurred hauling, implants, and brand inspection. The next step for improvement at this stage would be to get more animals to rate choice and prime, when they are slaughtered. This could be achieved by using an implant that would cause more of the meet to become marled with fat. This would also require the steers to consume a higher concentrated ration.

As a result of all of these steps the average total cost of raising a holstein steer was $1309.18 and the average price received for its beef was $1546.00. This left for a $236.82 profit per holstein steer. Even with a $236.82 profit, there is room for improvement. Dyt Dairy can work on getting their animals bigger at an earlier stage, with the possible benefit of getting their steers to make grades at an lower weight. This in turn will lower the amount of investment and allow for more profit. Also the feed prices are on the downward trend. This also will contribute to a lower input cost, and allow them to purchase higher quality feeds.

**Conclusion**

This experiment showed that holstein steers can be raised for a quality beef product and can generate a profit. The steers at Dyt Dairy were performing well and able to bring in $236.82. There was a weighted average cost of $2.99 per day, and steers were getting slaughtered at 430 days. The rate of gain the first 135 days was 2.67 pounds, and the total cost was $311.41. At Dyt Dairy #2, the average rate of gain was 2.77 pounds for 150 days, and the total costs incurred
was $411.42. At OK Cattle the rate of gain was 3.52 pounds per day for an average of 145 days, and the average cost was $545.35. The average rates of gain were at good levels, but there was still room for improvement, especially in the first 300 days. Things that should be considered before starting a Holstein steer program are having a proper mixed ration, a good implant system, and a close market. With over $230 dollars left on the table, Dyt Dairy can expand their steer herd and look for other ways to improve their steer program.
List of References


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