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An Evaluation of the Risk and Return Associated with Four Cattle Feeding Alternatives in Utah

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The cattle industry in Utah is predominantly a cow-calf industry. Most producers calve in late winter/early spring and wean the calves in the fall at approximately 8 months of age. Most of these calves are then sold and shipped out of state to go into various stocker or cattle feeding programs.

There are producers who retain their calves after weaning and feed them for an extended period of time before selling them. Some may feed the weaned calves through the winter and then graze them out the following summer. These yearling calves are then likely sold when they are 18 to 20 months of age. Other producers may feed their calves for a shorter time period, perhaps only 3 to 4 months and then sell them in the late winter/early spring at approximately 1 year of age.

In addition to cow-calf producers who may feed calves for some period of time following weaning, there are also cattle producers in Utah who specialize in feeding cattle and may not own any cows, or the cow-calf enterprise is viewed separately from the cattle feeding enterprise. For those producers who choose to feed cattle, what type of cattle feeding alternative is most profitable? Which cattle feeding alternative has lower risk than others? The objective of this fact sheet is to provide an answer or partial answer to these questions.

Four Feeding Alternatives

Four different cattle feeding alternatives are analyzed: backgrounding beef steer calves, finishing beef yearling steers, finishing Holstein yearling steers, and feeding cull cows.

There are many different backgrounding programs. All are designed to feed calves from weaning until the time the calves are placed on a finishing ration. Calves being backgrounded, as compared to cattle being finished, are fed a higher percentage of roughage than grain. Backgrounding rations vary considerably based on available feed stuffs, size and age of the cattle and on the cattle feeder's preference. For this analysis it is assumed that the producer would purchase steer calves in the fall weighing 550 pounds, feed them for 100 days on an alfalfa hay, grass hay and corn grain diet, and would achieve an average daily gain (ADG) of 2.25 pounds.

The U.S. cattle feeding industry is dominated by those who purchase yearling beef cattle and feed them on a high energy, typically corn-based ration, to a finished weight. Cattle feeders in Utah are no different, other than the fact that barley might replace some or all of the corn in the ration. For this analysis, it is assumed that yearling beef steers are purchased in the fall at 900 pounds, fed for 120 days on a corn grain, alfalfa hay, and grass hay diet, and the cattle would have an ADG of 3.5 pounds.

Because of the dairy industry in Utah, there is also the opportunity to feed Holstein steers in addition to steers from beef breeds. This is an often overlooked feeding alternative. Holstein steers can be purchased relatively inexpensively when compared to beef steers and provide another exploitable opportunity for cattle producers. Research shows that Holstein steers perform just as well as, or better than, beef steers in regards to ADG (Feedlot Performance and Cost Monitoring Program 1987; Fanatico 2000). Also, past studies indicate that a Holstein steer is more likely to grade prime than a beef steer (Burdine et al., 2004). For this analysis it is assumed that Holstein steers would be purchased in the fall at 1000 pounds, fed for 120 days on a corn grain and alfalfa hay diet, and the ADG would be 3.5 pounds.

The last feeding alternative is to feed cull cows. Most producers cull and sell their cows in the fall when prices are the lowest and the cattle are in poor condition. A large supply of thin cull cows going to market in the fall provides an opportunity for producers to purchase these cattle at low cost, fatten the cattle over the winter, and sell the cattle in late winter/early spring when cull cow prices are typically higher than in the fall. Many different feeding rations could be fed to cull cows. For this analysis it is assumed that the cows would be purchased in poor condition (Cutter grade) at 1000 pounds, fed for 100 days on a corn grain and alfalfa hay ration, and would increase in quality to the Breaking grade and would have an ADG of 3.2 pounds.

Data and Analysis Method

It is assumed for this analysis that cattle purchases occurred in October and that sales occurred in February. Monthly price data for October 1999-2008 and for February 2000-2009 were obtained for each class of cattle. The beef calves, beef yearling steers, and cull cow data were obtained through USDA-AMS reports of Producers Livestock Auction located in Salina, Utah. The Holstein feeder prices were obtained from the Smithfield, Utah, Auction. Beef and Holstein finished cattle prices were from the USDA-AMS weekly live cattle report. The October monthly average prices for alfalfa hay and corn grain were calculated from the USDA-AMS weekly reports for Utah hay and for Utah Grain.

Enterprise budgets were constructed for each feeding alternative based on the above stated assumptions and based on the historic cattle and feed prices. This information was used to determine the historical profitability of each cattle feeding alternative.

In addition to determining historic profitability, a simulation analysis was conducted to determine the probability of returns in the future. The simulation allows prices to vary based on past variability and also allows for initial weight and ADG for each feeding alternative to be somewhat variable. This adds more risk into the analysis and more closely represents the true risk faced by cattle feeders.

Results

The results of the historical analysis are displayed in Table 1. The table shows the mean, standard deviation, and the minimum and maximum returns during the 10 year period for the four cattle enterprises. The only enterprise that produced a positive yearly return on average during the time period was finishing Holstein yearling steers. The other three enterprises proved to have negative yearly returns on average during the time period. The enterprise that produced the largest average yearly loss was backgrounding beef steer calves.

The standard deviation for each enterprise represents the variability in returns for each enterprise during the 10-year time period. Finishing Holstein yearling steers had the largest standard deviation indicating that there was more variability in returns for this enterprise than for any of the other alternatives. However, when one compares the minimum and maximum returns for this enterprise to the other enterprises, it becomes evident that this large variability is centered around a more favorable return than the other enterprises.

Backgrounding steer calves proved to have the smallest standard deviation meaning that there was less volatility in returns for this enterprise than for the other three enterprises. However, when the minimum and maximum returns are taken into consideration, it becomes apparent that this enterprise never produced a positive return during the time period.

All of the returns shown in Table 1 include interest on the cattle and feed. There is also a yardage charge of $.30 per head per day, or $30 per head for the backgrounding and cull cow alternative and $36 per head for the two finishing alternatives. For producers who are feeding cattle on their own place, actual yardage costs may not be that high. Without a yardage charge the average returns would be -$25.72, $2.02, $100.24 and $13.71 for the backgrounding, beef yearling finishing, Holstein yearling finishing and cull cow feeding alternatives, respectively. The standard deviations would not change and the maximum and minimum values would increase by either $30 or $36 per head. Even when no yardage is charged, the backgrounding alternative is still not profitable.

One additional caution in interpreting these results is that a fixed ration and accompanying ADG was used for each alternative. It may well be that a different ration and a different ADG may be more or less profitable than the ration depicted in these results.

Now that the results from the historical analysis have been reported for each enterprise, the next step in the analysis is to see how each of these enterprises is expected to perform in the future through the use of simulation. Results of the simulation analysis are shown in Figure 1. Each line represents the cumulative distribution function (CDF) for the respective alternative. A CDF shows the returns on the horizontal axis and the risk or expected probability of the return on the vertical axis.

Table 1. Historical Returns from 1999-2000 to 2008-09.				
	Backgrounding Beef Calves	Finishing Yearling Steers	Finishing Holstein Steers	Feeding Cull Cows
Average	-$55.72	-$33.98	$64.24	-$16.29
Standard Dev.	$26.98	$79.69	$82.32	$70.86
Minimum	-$97.70	-$146.86	-$95.31	-$167.04
Maximum	-$2.29	$111.79	$165.01	$78.50
Years Profitable	0	3	8	4
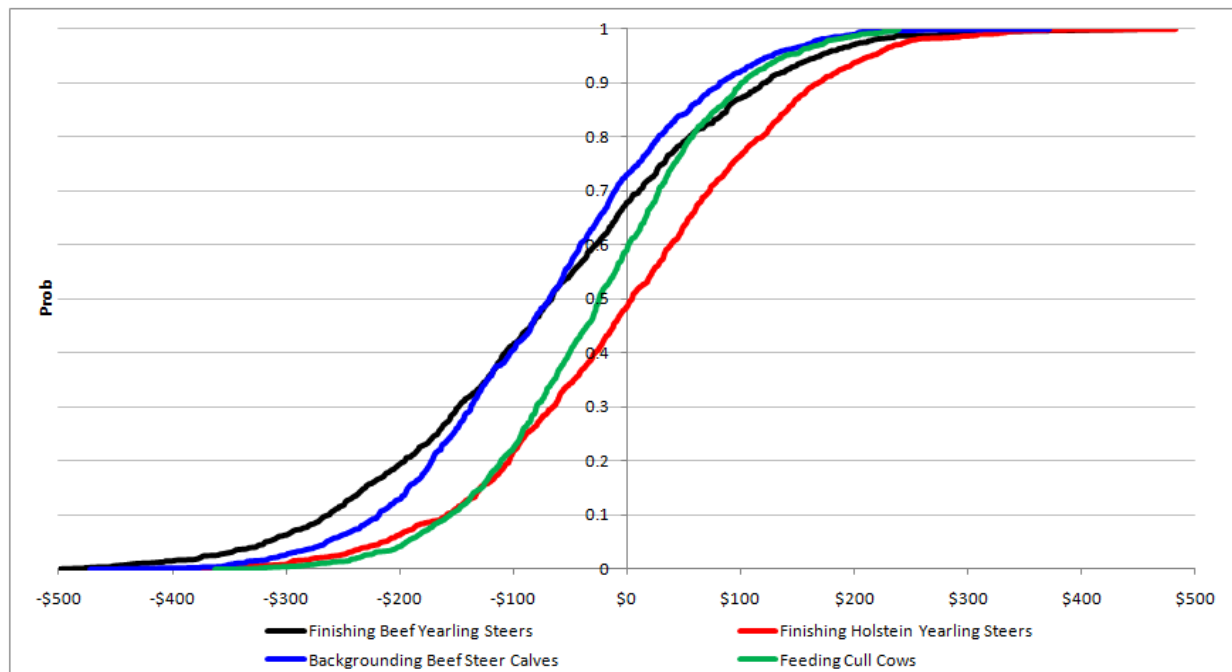
Figure 1—Expected Returns

For the yearling beef steers finishing alternative, there is a 32% chance of receiving a positive return with a 13% chance that the positive return will be greater than $100 per head. For the yearling Holstein steers finishing alternative, there is a 51% chance of receiving a positive return and there is a 23% chance that the return will be greater than $100 per head. For the backgrounding beef steer calves alternative, there is a 27% chance of receiving a positive return, yet only an 8 percent chance that the return will be over $100 per head. The final alternative, feeding cull cows, shows that there is a 41% chance of receiving a positive return and a 10% chance the return will be over $100 per head.

As can be seen by the curvature of the cull cow CDF, feeding cull cows is the alternative that is the least volatile in the simulation of future returns, meaning the returns for this alternative are more consistent and easily predicted than the other feeding alternatives. However, just because cull cows are the least volatile alternative does not mean that they should be the most preferred alternative. When comparing the four enterprises to each other there is a trade-off between risk and return. Each producer needs to consider how much risk they are willing to tolerate for an acceptable level of return.

In summary, this analysis has shown the risk and expected returns for four cattle feeding alternatives.

From the four feeding alternatives shown, finishing yearling Holstein steers is expected to be the most profitable. Feeding cull cows is next most profitable and is less risky than feeding Holstein steers. Backgrounding steer calves, with the ration and ADG used here, does not appear to be a very attractive alternative

References

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