W 427-A

Profitability of Retained Ownership: Tennessee Beef Evaluation

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Introduction

Retained ownership is a marketing strategy that allows producers to own cattle beyond weaning. The Tennessee Beef Evaluation Program assists Tennessee cattle producers in retaining ownership of their cattle through the feedlot. University of Tennessee (UT) Extension personnel coordinate the process whereby producers consign and ship cattle to one of several Iowa feedlots participating in the Tri-County Steer Carcass Futurity Cooperative (TCSCFC), headquartered in Lewis, Iowa, where the feeding phase begins. At the end of the feeding period, packers purchase cattle from participating feedlots based on a grid pricing system.

The Tennessee Beef Evaluation Program began in 1991 as an educational program for producers. A program objective was to provide producers with information to make management modifications that increase the profitability of their operation. From an educational standpoint, the program helps producers gain a better understanding of the feeding and packing phases of the beef production system. From a farm business standpoint, the program provides producers with feedlot performance and carcass-quality data that can be used to adjust herd genetics or management practices to improve feedlot performance and carcass quality. More information about the Tennessee Beef Evaluation Program is available at: economics.ag.utk.edu/tnbeefevaluation.

The cattle feeding industry has constantly evolved, as has the quality of cattle entering the feedlot. Feedlots have become more efficient, relying more on data-driven management decisions. Cattle finish at heavier weights and generally grade higher than cattle in the 1990s. Additionally, finished cattle are marketed more frequently using formula pricing, negotiated grid pricing and forward contracts. These changes in cattle feeding and marketing can have implications on the decision to retain ownership. The objective of this publication is to provide information to cattle producers about the expected profitability of retaining ownership of cattle through the Tennessee Beef Evaluation Program.

Data

This study evaluates data collected from November 2004 through February 2015. Data collected include prices, feedlot costs, animal characteristics, the opportunity cost of retained ownership, and the revenue and retained ownership profitability associated with the animals. There were 2,303 steers and 698 heifers shipped from Tennessee to one of 11 TCSCFC feedlots during this period. Ten heifers and 38 steers died during the feeding phase resulting in a feedlot death loss of 1.7 percent for steers and 1.4 percent for heifers. The data were broken down between steers and heifers and by feedlot placement season.

Animal Characteristics

The average placement weight for steers was 728 pounds, whereas the average placement weight of heifers was 677 pounds (Table 1). On average, both heifers and steers were on feed for approximately 148 days. Heifers exhibited a higher feed-to-gain ratio than steers, whereas steers had a higher average daily gain than heifers, which speaks to steers being more efficient than heifers at converting feed to body weight. The average number of health treatments (0.30 for steers and 0.31 for heifers) and dressing percentage (62 percent for both steers and heifers) were very similar for steers and heifers (Table 1). Steers were harvested at heavier weights than heifers and gained more weight in the feedlot than heifers.

Table 1. Summary Statistics for Steers and Heifers Included in the Tennessee Beef Evaluation Program for 2005-2015

	Steers			Heifers		
Variable	Average	Min.	Max.	Average	Min.	Max.
Placement Weight (lb)	728	425	1,110	677	410	1,070
Days on Feed	148	101	206	148	101	206
Dry Matter Intake (lb)	3,384	1,556	5,428	3,097	1,458	4,808
Feed-to-Gain Ratio	6.54	4.20	10.76	6.91	4.56	13.08
Average Daily Gain	3.53	1.05	5.66	3.06	1.20	5.13
# of Health Treatments	0.31	0	5	0.30	0	4
Dressing %	61.5%	53.6%	69.7%	61.8%	56.2%	67.2%
Harvest Weight (lb)	1,250	800	1,665	1,131	871	1,577
Feedlot Gain (lb)	522	155	983	454	153	682

Note: *Summary statistics in the table exclude death loss and result in 2,303 steers and 698 heifers. Ten heifers and 38 steers died during the feedlot phase. For the steers that died in the feedlot phase, average placement weight was 633 pounds and number of health treatments was 2.7. For the heifers that died in the feedlot phase, average placement weight was 741 pounds and the number of health treatments was 2.2.*

Explanation of variables:

Placement weight is the weight of the animal (lb) at the time of its placement into the feedlot.
Days on feed is the interval between the delivery date when the cattle entered the feedlot and the harvest date of the cattle.
Dry matter intake (lb) is the total dry matter intake of the animal calculated based on the Cornell Net Carbohydrate Energy system, with adjustments to carcass composition.
Feed-to-gain ratio is the total pounds of feed consumed on a dry-matter basis divided by feedlot gain (lb).
Average daily gain is the ratio of feedlot gain (lb) and days on feed.
The number of health treatments is the number of individual health treatments for the animal during the feedlot stage.
Dressing percentage is the hot carcass weight divided by the harvest weight times 100 ([hot carcass weight ÷ harvest weight] x 100 = dressing percentage).
Harvest weight is the weight of the animal (lb) at the time of harvest.
Feedlot gain is the difference between harvest weight and placement weight (lb) (harvest weight - placement weight = feedlot gain).

The heaviest placement weight of animals was in the spring with steers averaging 800 pounds and heifers averaging 759 pounds (Table 2). Average daily gain was highest for steers placed in the spring and summer at 3.7 pounds per day and was highest for heifers when entering the feedlot in the winter and spring at approximately 3.2 pounds per day (Table 2). Both steers and heifers placed in the fall spent the most days in the feedlot, averaging 156 days. The majority of steers and heifers were placed in the feedlot in the winter and summer months. Of the animals in this analysis, 37 percent of steers (856 head) and 33 percent of heifers (228 head) were placed in the feedlot during the winter months, and 675 steers (29 percent) and 209 heifers (30 percent) were placed in the feedlot during summer. Meanwhile, 25 percent of steers (587 head) and heifers (178 head) were placed in the feedlot during the fall. The spring months had the lowest feedlot placement rates with 185 steers (8 percent) and 83 heifers (12 percent).

Table 2. Summary Statistics of Cattle Performance by Placement Season for 2005-2015

Placement Season[a]	Spring		Summer		Fall		Winter	
	Steer	Heifer	Steer	Heifer	Steer	Heifer	Steer	Heifer
Placement Weight	800	759	764	693	701	674	702	635
# of Health Treatments	0.23	0.48	0.28	0.22	0.26	0.18	0.37	0.4
Days on Feed	132	130	144	148	156	156	149	149
Dry Matter Intake (lb)	3,001	2,687	3,321	3,066	3,444	3,089	3,478	3,282
Feed-to-Gain Ratio	6.29	6.57	6.4	6.97	6.66	7.19	6.63	6.76
Average Daily Gain	3.67	3.18	3.68	3.05	3.38	2.8	3.49	3.22
Dressing %	61.40%	61.50%	61.40%	61.80%	61.50%	61.90%	61.50%	61.80%
Harvest Weight	1,281	1,173	1,287	1,136	1,224	1,115	1,231	1,125
Feedlot Gain	481	414	523	443	523	441	529	489
# Finished Head	185	81	668	209	574	175	838	223
# Head Died in Feedlot	0	2	7	0	13	3	18	5

[a] *Placement season: Spring = March-May; Summer = June-August; Fall = September-November; Winter = December-February.*

Note: *Summary statistics in the table exclude death loss and result in 2,303 steers and 698 heifers. Ten heifers and 38 steers died during the feedlot phase.*

Explanation of variables:

Placement weight is the weight of the animal (lb) at the time of its placement into the feedlot.

Days on feed is the interval between the delivery date when the cattle entered the feedlot and the harvest date of the cattle.

Dry matter intake (lb) is the total dry-matter intake of the animal calculated based on the Cornell Net Carbohydrate Energy system, with adjustments to carcass composition.

Feed-to-gain ratio is the total pounds of feed consumed on a dry-matter basis divided by feedlot gain (lb).

Average daily gain is the ratio of feedlot gain (lb) and days on feed.

The number of health treatments is the number of individual health treatments for the animal during the feedlot stage.

Dressing percentage is the hot carcass weight divided by the harvest weight times 100 ([hot carcass weight ÷ harvest weight] x 100 = dressing percentage).

Harvest weight is the weight of the animal (lb) at the time of harvest.

Feedlot gain is the difference between harvest weight and placement weight (lb) (harvest weight - placement weight = feedlot gain).

Feedlot Costs

All of the feedlot costs, except miscellaneous, on average, were higher for steers than heifers (Table 3). For example, feedlot feed costs for steers averaged $337/head and feedlot feed costs for heifers were $292/head. However, feedlot feed cost per pound of gain was the same for steers and heifers at about 65 cents per pound. While total feedlot costs for steers were higher than heifers, with a difference of $54/head, the total feedlot cost per pound of gain was similar for steers and heifers at about $1 per pound of gain. Note that the total feedlot cost includes feed costs, health treatments, vaccines, yardage, trucking, checkoff and miscellaneous expenses.

Table 3. Summary Statistics of Feedlot Costs ($/head) by Cattle Sex for 2005-2015

Variable	Steer			Heifer		
	Average	Min.	Max.	Average	Min.	Max.
Feed Cost	337.26	133.28	778.92	291.50	126.06	705.05
Health Treatment	9.52	0.00	160.54	8.06	0.00	128.08
Vaccines	16.79	4.43	38.20	15.73	4.43	36.96
Yardage	54.67	36.11	74.73	53.20	36.11	74.73
Trucking & Checkoff	63.23	29.29	105.28	59.12	36.37	105.98
Miscellaneous	22.94	17.22	29.92	23.01	18.55	29.92
Total Feedlot Cost	504.41	281.54	1,008.22	450.63	275.44	897.31
Feed Cost per Pound of Gain ($/lb)	0.65	0.26	1.49	0.64	0.28	1.55
Total Feedlot Cost per Pound of Gain ($/lb)	0.97	0.54	1.93	0.99	0.61	1.98

Note: *Values are adjusted for inflation to 2015 dollars. Summary statistics in the table exclude death loss and result in 2,303 steers and 698 heifers. Ten heifers and 38 steers died during the feedlot phase. For steers that died during the feedlot phase, average health treatments were $96/head, vaccines averaged $4/head, yardage averaged $17/head, trucking and checkoff averaged $43/head, and miscellaneous costs averaged $3/head. For heifers that died during the feedlot phase, average health treatments were $80/head, vaccines averaged $6/head, yardage averaged $36/head, trucking and checkoff averaged $37/head, and miscellaneous costs averaged $4/head.*

Explanation of variables:
Feed cost was computed as total feed dry matter (lbs) times the cost of the ration dry matter ($/lb).
Health treatment is the cost of individual health treatments.
Vaccines is the cost of vaccines.
Yardage is the number of days the animal was on feed multiplied by the feedlot's yardage charge.
Trucking and checkoff is the checkoff cost and the cost of transportation for the cattle from Tennessee to Iowa and the cost of transportation for the cattle from the feedlot in Iowa to the packing plant to be slaughtered.
Miscellaneous expenses include interest paid less interest received, tags, peril insurance, labor, scale charge and electrolytes, if used.
Total feedlot cost is the summation of miscellaneous, trucking and checkoff, yardage, vaccines, health treatment and feed costs.
Feed cost per pound of gain is the feedlot feed cost divided by the respective feedlot gain from Table 1.
Total feedlot cost per pound of gain is the total feedlot cost divided by the respective feedlot gain from Table 1.

Total feedlot costs were the highest for steers and heifers placed in the feedlot in the winter (Table 4). This result is likely influenced by weather conditions. Cattle placed in the fall and winter often face cold and wet conditions, which negatively impact feed efficiency and result in cattle remaining on feed longer than cattle placed in other seasons. On average, total feedlot cost per pound was also highest in the winter placement season at $1.03 per pound for steers and $1.08 per pound for heifers (Table 4). Total feedlot costs were higher for steers than heifers in all placement seasons (Table 4). The difference in total feedlot cost was smallest for steers and heifers in the winter placement season.

Table 4. Summary Statistics of Feedlot Costs ($/head) by Placement Season for 2005-2015

Placement Season[a]	Spring		Summer		Fall		Winter	
	Steer	Heifer	Steer	Heifer	Steer	Heifer	Steer	Heifer
Feed Cost	301.67	254.14	308.49	265.31	327.74	251.69	374.56	360.85
Health Treatment	6.87	11.68	8.76	6.48	8.37	3.26	11.5	11.99
Vaccines	9.57	7.58	16.47	15.69	18.63	16.72	17.38	17.97
Yardage	51.54	52.15	52.87	50.53	53.86	51.41	57.37	57.49
Trucking/Checkoff	61.56	53.9	65.48	60.18	63.14	62.71	61.85	57.22
Miscellaneous	21.7	22.93	21.09	22.48	24.33	22.42	23.73	23.99
Total Feedlot Cost	452.91	402.39	473.17	420.68	496.07	408.23	546.39	529.5
Feed Cost per Pound of Gain	0.63	0.61	0.59	0.6	0.63	0.57	0.71	0.74
Total Feedlot Cost per Pound of Gain	0.94	0.97	0.9	0.95	0.95	0.93	1.03	1.08
# Finished Head	185	81	668	209	574	175	838	223
# Head Died in Feedlot	0	2	7	0	13	3	18	5

[a] *Placement season: Spring = March-May; Summer = June-August; Fall = September-November; Winter = December-February.*

Note: *Values are adjusted for inflation to 2015 dollars. Summary statistics are only available for cattle that did not die in the feedlot phase. Thus, the summary statistics exclude death loss. Ten heifers and 38 steers died during the feedlot phase.*

Explanation of variables:

Feed cost was computed as total feed dry matter (lb) times the cost of the ration dry matter ($/lb).
Health treatment is the cost of individual health treatments.
Yardage is the number of days the animal was on feed multiplied by the feedlot's yardage charge.
Trucking and checkoff is the checkoff cost and the cost of transportation for the cattle from Tennessee to Iowa and the cost of transportation for the cattle from the feedlot in Iowa to the packing plant to be slaughtered.
Miscellaneous expenses include interest paid less interest received, tags, peril insurance, labor, scale charge and electrolytes, if used.
Total feedlot cost is the summation of miscellaneous, trucking and checkoff, yardage, vaccines, health treatment and feed costs.

Feed cost per pound of gain ($/lb) is the feedlot feed cost divided by the respective feedlot gain from Table 2.
Total feedlot cost per pound of gain ($/lb) is the total feedlot cost divided by the respective feedlot gain from Table 2.

Opportunity Cost

The opportunity cost of retained ownership is how much money the cattle producer would have made had he/she sold the animal instead of retaining ownership. Therefore, the opportunity cost of retained ownership is defined as the feedlot delivery weight of the feeder steer/heifer multiplied by the market value of the feeder steer/heifer ($/cwt) at the time of delivery to the feedlot. The feeder steer/heifer market values were determined by weighing the animal and evaluating the frame size and muscling. The Tennessee USDA Agricultural Marketing Service (AMS) weekly auction report of feeder cattle price for the associated class was used for the animal's market price. The average opportunity cost of steers was higher than heifers at $815 per head for steers, compared to $668 per head for heifers (Table 5). The average opportunity cost of retaining ownership was the highest, on average, in the summer for both steers and heifers at $906 per head for steers and $708 per head for heifers (Table 6).

Revenue

After the feedlot phase, the cattle were sold on a grid pricing system at a Tyson packing plant in Dennison, Iowa.[1] Grid pricing is one of three common methods of pricing finished cattle. Grid pricing is a method of pricing individual animals based on the quality and yield grade of the animal, which influences the value of the beef from the animal. Thus, the seller assumes the risk associated with dressing percentage, quality grade and yield grade in a grid pricing system. Alternative pricing systems include selling cattle on a live basis or dressed basis. When sold on a live basis, the buyer values the animal while it is still alive. The buyer values the animal based on expectations of dressing percentage, quality and yield, which means the buyer assumes all of these risks. When sold on a dressed basis, the buyer values the animal based on hot carcass weight and expectations of quality and yield. The seller assumes risk associated with dressing percentage, while the buyer assumes quality and yield risk. Using grid pricing, total revenue received is defined as the following:

$$(1) \quad Revenue = Hot\ Carcass\ Weight \times Carcass\ Price + Age\ Verified\ Premium$$

where *Carcass Price* is the grid price received for the animal, which is function of yield and quality grade and includes any Certified Angus Beef premiums received, and *Age-Verified Premium* is equal to any age-verified premiums received. The average hot carcass weight and carcass price were typically higher for steers than heifers, which resulted in higher total revenue received for steers than heifers in all placement seasons (Tables 5 and 6).

Retained Ownership Profitability

The profitability of retained ownership is the net returns associated with retaining ownership of cattle, instead of selling the cattle the day it entered the feedlot. Thus,

$$(2) \quad Retained\ Ownership\ Profit = Revenue - Feedlot\ Cost - Opportunity\ Cost - Death\ Loss\ Adjustment\ Factor$$

Retained Ownership Profit is the net returns ($/head) associated with the steer/heifer; *Revenue* is defined in equation (1); *Feedlot Cost* is the cost for finishing the animal ($/head), which is the sum of total feed costs, health treatment costs, vaccine costs, yardage, trucking, data collection fee,

1 This packing plant is now closed and TCSCFC now sells cattle to the Tyson packing plant in Dakota City, Nebraska.

checkoff fee and miscellaneous costs, such as ear tags and interest; *Opportunity Cost* is the opportunity cost of retained ownership ($/head); and *Death Loss Adjustment Factor* is the average cost of death loss across all animals ($/head). The opportunity cost is the amount the cattle producer would have received if they had sold the animal on the day it entered the feedlot. The death loss adjustment factor is calculated by dividing the total death loss cost by the number of cattle that were finished.

Retained ownership profit (on cattle that finished) when not accounting for death loss was $43.62/head for steers and $61.56/head for heifers (Table 5). Retained ownership profit before accounting for death loss was highest for steers in the winter and highest for heifers in the spring (Table 6). Retained ownership profit when accounting for death loss (total retained ownership profit), on average across all years, was higher for heifers than steers (Table 5). Retained ownership when accounting for death loss was most profitable in the winter for steers and in the spring for heifers. We compare total retained ownership profits when accounting for death loss on an annual basis and by placement season between steers and heifers in the next section.

Table 5. Summary Statistics of Costs and Revenue by Cattle Sex for 2005-2015

Variable	Steer			Heifer		
	Average	Min.	Max.	Average	Min.	Max.
Costs						
Opportunity Cost ($/head)	815.40	285.60	1,605.90	667.86	396.31	1,611.65
Total Feedlot Cost ($/head)	504.41	281.54	1,008.22	450.63	275.44	897.31
Revenue						
Hot Carcass Weight (lbs)	768.06	516.00	1,010.00	698.82	528.00	955.00
Carcass Price ($/cwt)	175.02	107.30	271.34	165.60	120.59	281.76
Age-Verified Premium ($/head)	19	0	39	23	0	39
Total Revenue ($/head)	1,363.43	643.75	2,375.60	1,180.05	744.05	2,229.04
Retained Ownership Profit on Cattle that Finished ($/head)	43.62	-440.85	673.38	61.56	-521.35	404.15
Sunk Cost of Dead Cattle						
Cost of Dead Cattle	-29,385.56			-6,424.35		
Death Loss Adjustment Factor	-12.97			-9.34		
Total Retained Ownership Profit ($/head)	30.64			52.22		

Note: *Values are adjusted for inflation to 2015 dollars. Total Retained Ownership Profit reflects average returns including death loss for all 2,303 steers and 698 heifers.*

Explanation of variables:

Opportunity cost is the feedlot delivery weight of the feeder steer/heifer multiplied by the market value of the feeder steer/heifer ($/cwt) at the time of delivery to the feedlot.

Total feedlot cost is the total feedlot costs from Table 3.

Hot carcass weight is the hot carcass weight in pounds.

Carcass price is the price per hundredweight for the animals and is based on grid pricing.

Age-verified premium is equal to any age-verified premium received.

Total revenue is the hot carcass weight multiplied by the carcass price plus any age-verified premium received.

Retained ownership profit on cattle that finished is revenue minus feedlot costs minus opportunity cost.

Cost of dead cattle is the total lost revenue associated with the cattle that died during the feedlot phase.

Average loss over all cattle is the cost of dead cattle divided by the total number of living cattle in each category.

Total retained ownership profit is revenue minus feedlot costs minus opportunity cost death loss adjustment factor.

Table 6. Summary Statistics of Feedlot Costs ($/head) by Placement Season for 2005-2015

Placement Season[a]	Spring		Summer		Fall		Winter	
	Steer	Heifer	Steer	Heifer	Steer	Heifer	Steer	Heifer
Costs								
Opportunity Cost ($/head)	802.72	686.00	906.14	708.07	808.76	664.76	750.42	626.02
Total Feedlot Cost ($/head)	452.91	402.39	473.17	420.68	496.07	408.23	546.39	529.5
Revenue								
Hot Carcass Weight (lbs)	786.58	721.12	790.45	701.77	752.35	690.21	756.89	694.73
Carcass Price ($/cwt)	163.22	164.43	169.54	160.26	178.46	160.94	179.64	174.68
Age-Verified Premium ($/head)	25	27	20	24	19	19	20	24
Total Revenue ($/head)	1,309.11	1,212.60	1,360.07	1,149.09	1,361.43	1,129.49	1,379.48	1,236.92
Retained Ownership Profit on Cattle That Finished ($/head)	53.48	124.21	-19.24	20.34	56.6	56.5	82.67	81.4
Sunk Cost of Dead Cattle	0	-1,678.58	5,130.44	0	11,745.10	1,826.91	12,510.00	2,918.85
Cost of Dead Cattle Death Loss Adjustment Factor	0	-20.72	-7.46	0	-20.46	-10.44	-14.83	-13.09
Total Retained Ownership Profit ($/head)	53.48	103.49	-26.70	20.34	36.14	46.06	67.74	68.31
# Finished Head	185	81	688	209	574	175	838	223
# Head Died in Feedlot	0	2	7	0	13	3	18	5

[a] *Placement season: Spring = March-May; Summer = June-August; Fall = September-November; Winter = December-February.*

Note: *Values are adjusted for inflation to 2015 dollars.*

Explanation of variables:

Opportunity cost is the feedlot delivery weight of the feeder steer/heifer multiplied by the market value of the feeder steer/heifer ($/cwt) at the time of delivery to the feedlot. Total feedlot cost is the total feedlot costs from Table 3. Hot carcass weight is the hot carcass weight in pounds. Carcass price is the price per hundredweight for the animals and is based on grid pricing. Age-verified premium is equal to any age-verified premium received. Total revenue is the hot carcass weight multiplied by the carcass price plus any age-verified premium received. Retained ownership profit on cattle that finished is revenue minus feedlot costs minus opportunity cost. Cost of dead cattle is the total lost revenue associated with the cattle that died during the feedlot phase. Average loss over all cattle is the cost of dead cattle divided by the total number of living cattle in each category. Total retained ownership profit is revenue minus feedlot costs minus opportunity cost death loss adjustment factor.

Total Retained Ownership Profits

Total retained ownership profits (when accounting for death loss) were positive in eight of the 11 years analyzed, with an average return of $35/head (Figure 1, Table 7). Retained ownership was most profitable in years 2005 and 2014, with an average profit of $206/head (Figure 1). Retained ownership was least profitable in year 2013, with an average loss of $76/head (Figure 1). Average retained ownership net returns of heifers were higher than steers in six of the 11 years (Figure 2). Overall, retaining ownership of cattle was profitable 65 percent of the time. Specifically, retaining ownership of steers and heifers was profitable 63 percent and 71 percent of the time, respectively. Retaining ownership of cattle was profitable, on average, in all placement seasons for heifers and was profitable, on average, in all placement seasons for steers, with the exception of summer (Figure 3).

The decision to retain ownership is largely influenced by the expectation of feed prices (corn price) and finished cattle prices. Thus, retained ownership profits are impacted by realized feed and finished cattle prices. Years with high corn prices generally result in reduced profits from feeding cattle such as what was experienced in the years 2007, 2008, 2009, 2012 and 2013 (Figure 3). However, high feed costs can sometimes be overcome by even higher finished cattle prices such as in the years 2011, 2014 and 2015.

Table 7. Retained Ownership Profits ($/head) of Cattle by Harvest Year

Year	All Cattle			Steer			Heifer		
	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.
2005	206	33	370	231	121	370	172	33	325
	26 head			15 head			11 head		
2006	-70	-1,203	329	-84	-1,203	329	4	-179	263
	304 head			256 head			48 head		
2007	8	-825	364	-10	-441	304	59	-825	364
	491 head			362 head			129 head		
2008	18	-920	240	14	-864	211	25	-920	240
	423 head			280 head			143 head		
2009	22	-875	268	16	-875	244	31	-670	268
	492 head			302 head			190 head		
2010	133	-904	404	131	-835	401	143	-904	404
	505 head			421 head			84 head		
2011	180	-847	532	180	-7822	532	177	-846	388
	197 head			176 head			21 head		
2012	-25	-1,381	295	-38	-1,381	295	52	-115	166
	285 head			245 head			40 head		
2013	-76	-938	673	-73	-938	673	-99	-521	260
	177 head			157 head			20 head		
2014	206	-217	498	206	-217	498	--	--	--
	48 head			48 head			0 head		
2015	131	-253	292	150	-253	292	69	-234	278
	53 head			41 head			12 head		
Average	35	-1,381	673	30	-1,381	673	51	-920	404
	3,001 head			2,303 head			698 head		

Note: *Ave.=average. Values are adjusted for inflation into 2015 dollars. In years with death loss, the min. value represents the lost value associated with an animal that died while in the feedlot.*

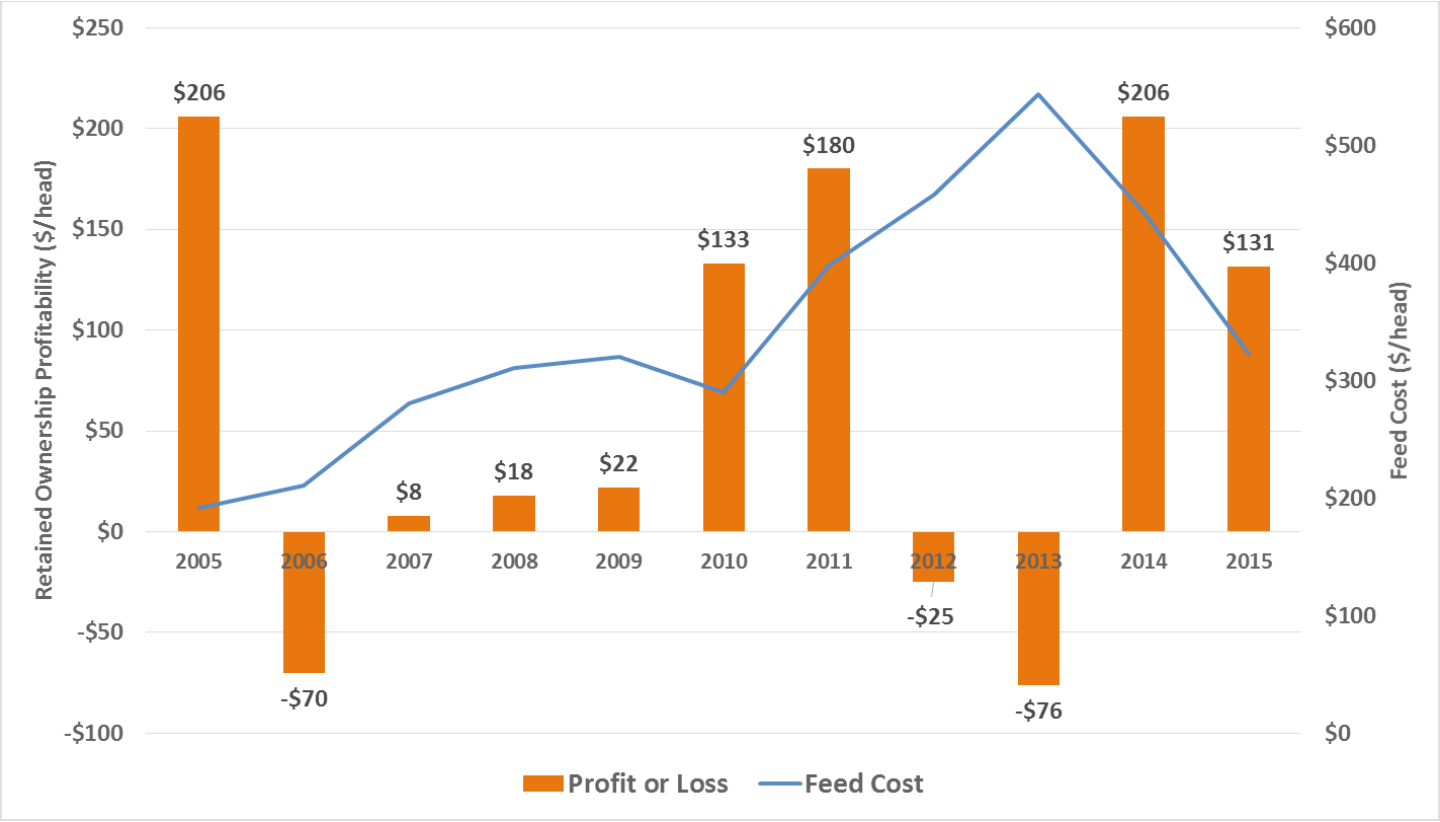

Figure 1. Retained Ownership Profitability by Harvest Year ($/head).
Note: Feed cost is equal to the cost of feed ($/head) of the animal while in the feedlot.

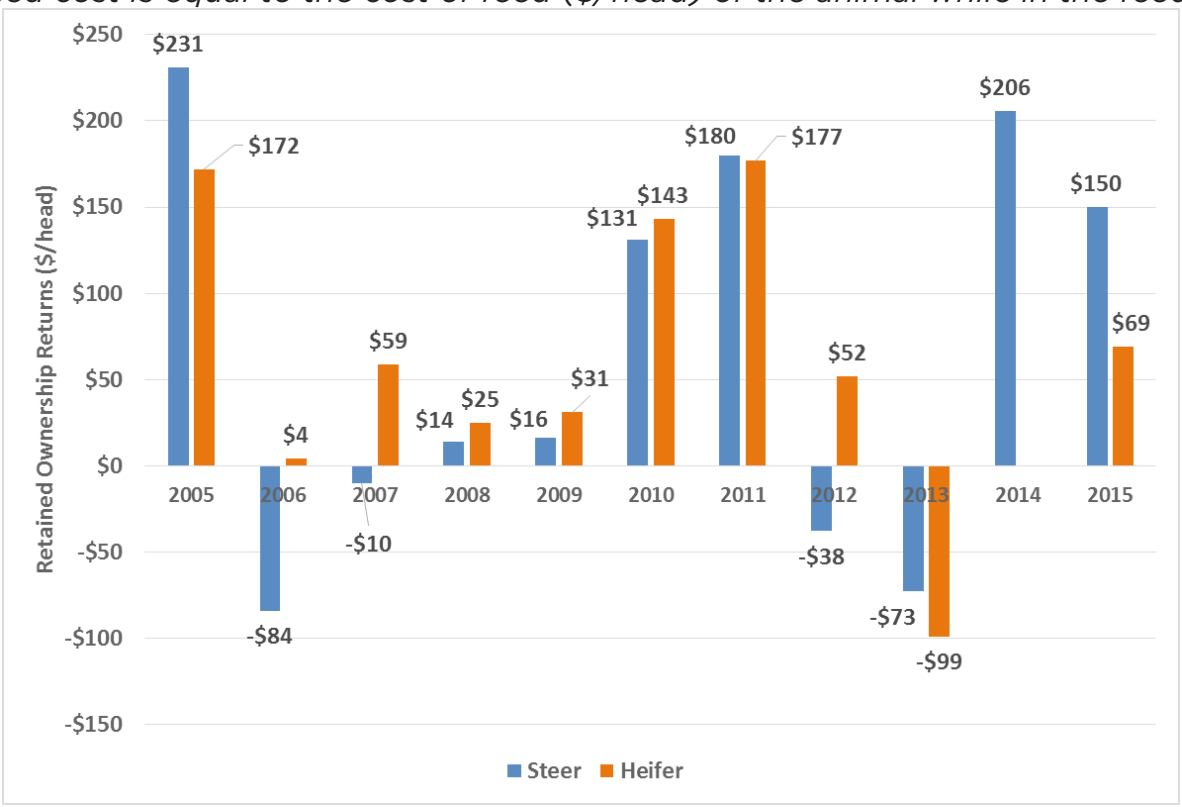

Figure 2. Retained Ownership Profitability for Steers and Heifers by Harvest Year ($/head).
Note: No heifers were retained in 2014.

Figure 3. Retained Ownership Profitability for All Cattle, Steers and Heifers by Placement Season ($/head).

Summary

Prices in the cattle industry have been highly volatile in recent years, making it important for cattle producers to understand available marketing alternatives and the historical profitability associated with market uncertainty. This study examined the profitability of retaining ownership of cattle compared to selling them from 2005 through 2015. Over this period, retained ownership was profitable in eight of the 11 years, with an average return of $35/head. Furthermore, 71 percent of the heifers retained were profitable, and 63 percent of the steers retained were profitable.

While heifers were more profitable to retain ownership of than steers, one shortcoming of this study was the small sample size of heifers relative to steers. Of the heifers that entered the feedlot, nearly 81 percent of them were retained from 2007 through 2010, whereas only 58 percent of steers in the study were in the feedlot in those same years. This could be driving the results indicating that heifers were more profitable to retain than steers.

It was determined that winter, fall and spring were more profitable placement seasons than summer. This finding is potentially a result of feeder cattle prices in the summer being higher than the other three placement seasons, which increased the opportunity cost calculation. Given retained ownership was a profitable marketing strategy from 2005 through 2015, it is likely that retained ownership will remain a

profitable marketing opportunity for cow-calf producers in the future. This result is especially true given declines in corn prices.

Producers considering retained ownership of cattle through the feedlot should consider several factors when making the retained-ownership decision. Factors to consider include:

- Expectation of feed prices,
- Expectation of finished cattle prices,
- Animal production performance (average daily gain, feed efficiency, etc.), and
- Animal carcass characteristics (quality grade and yield grade).

The aforementioned factors directly impact profitability. Profitability is positively impacted by low feed prices, high finished cattle prices, animals that grow quickly, animals that are feed efficient, and animals that grade well as it relates to quality grade and yield grade. A producer may need to feed a few cattle to know how his or her animals perform on feed and how their carcasses grade. This is the purpose of the Tennessee Beef Evaluation program.

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