

# New York Feedlot and Carcass Value Discovery Program 1999/2000 Report

## **A. Introduction.**

There is much written in the popular press about moving away from producing a beef as a commodity to producing for a niche or specialty market. The way to profitability in the commodity market is to produce as much as you can for as cheap as you can. If the cost of production is not below average, the business will not survive in the commodity market. Producing for a specialty market such as Laura's Lean, Certified Hereford Beef or Certified Angus Beef, or direct to the consumer has the potential to increase income from cattle sales. Producing for this market, however, requires that the cow/calf producer have a thorough understanding of the quality of the beef they are producing. Even in the commodity market, discounts are increasing on those carcasses that do not fit certain specifications. In today's market, whether it is commodity or specialty, cattlemen can no longer afford to lose track of their cattle after they leave the farm gate. The New York Feedlot and Carcass Value Discovery Program allows producers to track the performance and quality of their cattle. This report summarizes what we learned in the sixth year of the Value Discovery Program (1999-2000).

## **B. Materials and Methods.**

Nineteen farms consigned 124 head of steers and 47 head of heifers to the New York Feedlot and Carcass Value Discovery program in November 1999. The cattle were delivered on November 4 and 5 to the Beef Unit of the Cornell University Teaching and Research Center in Harford, NY. Prior to delivery the cattle had been vaccinated for IBR, BVD, PI<sub>3</sub>, BRSV, Leptospirosis, 7-way Clostridial, Pasteurella spp. and Haemophilus somnus, treated for internal and external parasites, supplemented with injectable Selenium and weaned for at least 30 days. On arrival the cattle were weighed and tagged, separated by sex and placed in feeding pens of 30-35 head. On November 11 and 12 the cattle were re-weighed. The average of the two weights (less a 4% pencil shrink) became the official start weight of the feedlot phase of the program. Cattle were implanted at different times throughout the feeding period. Depending on projected days on feed, some cattle were implanted two times. The final implant was administered at least 100 days prior to the projected harvest date. Two products were used: Synovex™ and Revalor™. The cattle were fed a conventional, corn based high energy ration (Table 1).

Table 1. Average Ration Fed to Steers and Heifers Consigned to 1999/2000 NY Value Discovery Program.

Ingredient	Ration % (as fed)	Ration % (dry matter)
Corn silage	37	19
High moisture ear corn	28	33
Dry shelled corn	23	31
Chopped hay	4	5
Soybean meal	7	10
Minerals/ionophore	1	2
NE <sub>m</sub> , Mcal/lb.	-	0.96
NE <sub>g</sub> , Mcal/lb.	-	0.57

CP, %	-	12
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Individual feed requirements were projected based on each animal's own performance with the Cornell Value Discovery Computer Program, as described in the 1997 Cornell Beef Field Day Report. Individual cattle were harvested at their optimal value determined by feedlot performance and existing market conditions. All animals were sold to MOPAC in Souderton, PA, on a grade and yield basis. An independent grader was hired to take carcass measurements: backfat, ribeye area, kidney, pelvic and heart fat, and quality grade. A USDA Yield grade was calculated using these measurements.

### C. Results.

#### 1. Cattle Description.

The following numbers of calves were sired by the different breeds: Angus-104; Red Angus-13; Polled Hereford-6; Murray Grey-9; Simmental-3; Shorthorn-16; Maine-Anjou Cross-20. The Dams of the calves were mainly Angus, Polled Hereford, Simmental and crosses, along with a few Limousin.

Twenty two percent of the calves were straight bred, with the remainder being cross bred. During the feeding period two steers died. One steer was diagnosed with Bovine Viral Diarrhea, the second died on the way to the slaughter plant of a suspected lung abscess. One heifer was condemned at the harvest facility for cancer.

Average initial weight of the steers and heifers was 604 lbs. and 562 lbs. respectively (Table 2), with the majority weighing between 500 lbs.-700 lbs. (Figure 1).

Table 2. Feedlot Performance of Steers and Heifers in 1999/2000 New York Feedlot and Carcass Value Discovery Program.

Item	Average	Min.	Max.	Average	Min.	Max.
	STEERS (123hd.)			HEIFERS (47 hd.)		
Initial weight, lb.	604	398	804	562	347	822
Finish weight, lb.	1275	970	1500	1098	812	1390
Age at delivery, mo.	7.7	5.4	10.0	7.9	4.0	14.3
Age at harvest, mo.	13.9	11.5	17.9	13.7	10.9	18.2
Days on feed	193	118	240	177	118	240
Average daily gain, lb.	3.5	2.1	4.7	3.1	2.0	4.1
Feed to gain, lb. DM	6.3	5.6	7.3	6.5	5.7	7.4

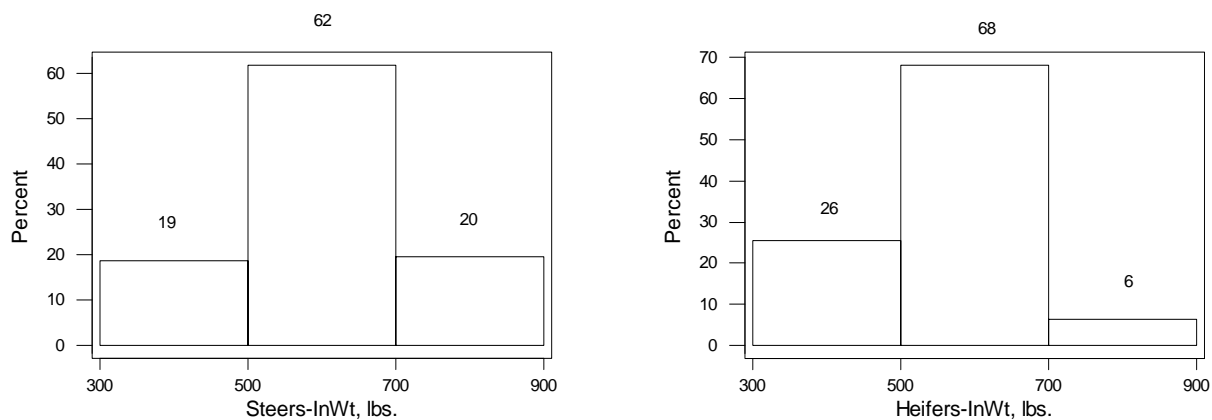


Figure 1. Initial weight of steers and heifers consigned to NY Value Discovery Program, 1999/2000.

A weight spread of 400 lbs. between the lightest and heaviest cattle presents a challenge to the feedlot manager. Most of the steers (80%) and heifers (82%) were 6-9 months old at delivery, placing the birth months at February through April.

Final harvest weight of the cattle, on average was acceptable. The steers and heifers

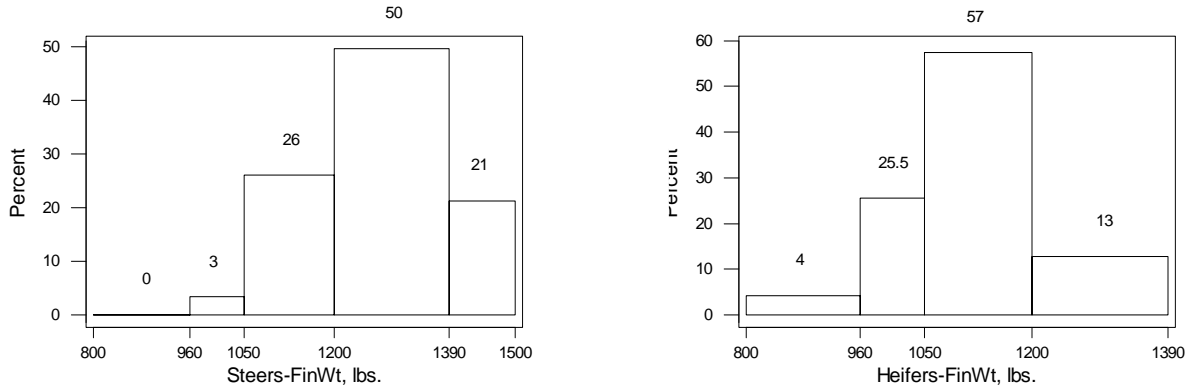


Figure 2. Final weight of steers and heifers consigned to NY Value Discovery Program, 199/2000.

averaged 1275 lbs. and 1098 lbs., respectively. Cattle weighing less than 960 lbs. and more than 1520 lbs. are likely to produce carcasses that are discounted. All steers fit within this window while 4% of the heifers were underweight (Figure 2). A weight range that is more acceptable to the current needs of the commercial retail industry is 1050 lbs. to 1200 lbs. Only 26% of the steers fit this window, whereas 57% of the heifers had an acceptable final weight.

The industry average for age at harvest is around 18 months. The majority of the cattle were calves at the start of the feeding program; therefore it would be expected that the harvest age would be younger. In fact these calves averaged less than 14 months of age when marketed. Days on feed averaged 193 and 177 for the steers and heifer respectively. Average daily gain was excellent for the steers at 3.5 lbs. with a range of 2.1 lbs. to 4.7 lbs. Over 70% of the steers gained in excess of 3.25 lbs./day (Figure 3), while just 7% gained under 2.75 lbs./day.

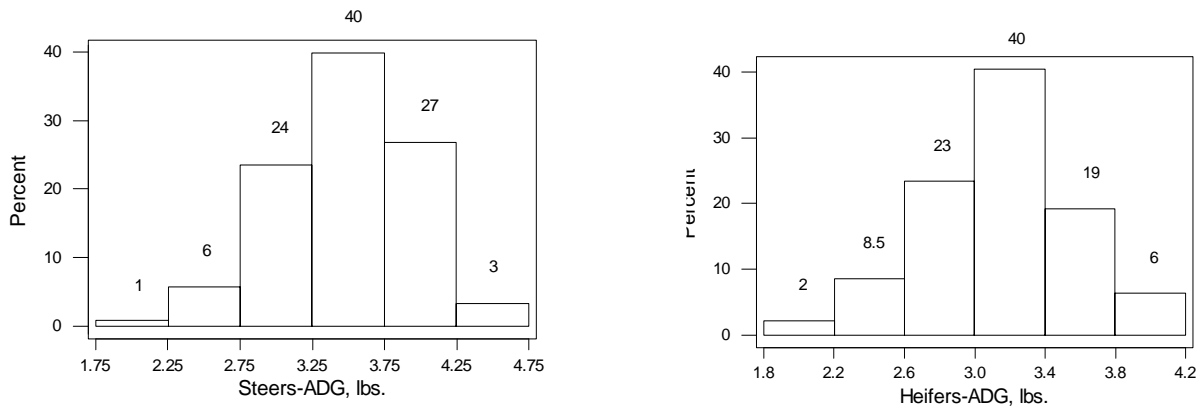


Figure 3. Average daily gain of steers and heifer consigned to the NY Value Discovery Program, 1999/2000.

The heifers also gained well, at more than 3 lbs. per day and followed the same distribution as the steers. Health of the cattle had an impact on performance. Steers that required treatment for illness gained 3.4 lbs./day, which was statistically different ( $P < .01$ ) from those cattle that remained healthy which gained 3.6 lbs./day. While numerically different, there was no statistical difference in the performance of treated or untreated heifers. A significant response is difficult to pick up with only 47 head.

A method developed by Perry and Fox (1997), for allocating feed to cattle on an individual basis considering differences known to affect requirements, including breed type, body size, and stage and rate of growth was used to calculate individual feed efficiency. Each pound of weight gain is composed primarily of two tissues: muscle and fat. This model predicts the quantity of muscle and fat in each pound of gain. The energy required to produce a pound of muscle and fat is different. Energy requirements for beef cattle are divided into two parts: 1) maintenance (vital organ function and body temperature maintenance, which is a function of body weight and environmental conditions) and 2) weight gain or growth. By predicting the quantity of muscle and fat in the gain (called composition of gain), and calculating the amount of energy required to maintain and grow them, it is possible to determine the energy requirement of the total gain. Having determined the aggregate amount of energy to maintain and grow the animal, we then determine the amount of feed that had to be consumed to meet these requirements. Adding together each animal's feed requirement gives the total DM required to produce the animal performance observed in the pen. The comparison of total feed DM delivered to DM required is presented in Table 3.

Table 3. Dry Matter Delivered to and Required by Steers and Heifers in 1999/2000 New York Feedlot and Carcass Value Discovery Program.

<b>DM Delivered, lbs.</b>	<b>DM Required, lbs.</b>	<b>Difference, lbs.</b>	<b>Ratio</b>
Steers (123 hd.)			
518886	514277	4609	.9911
Heifers (47 hd.)			
160484	162487	2003	1.01

While the ratio of the sum of each individual animal predicted DM required vs. total feed DM delivered showed a slight under prediction for the steers and a small over prediction for the heifers, the two estimates of feed usage were within 1% of each other. This model then, allows feed fed to a pen to be allocated across the individuals in the pen, based on their body size, rate and composition of growth and effects of environment on individual animals.

Dividing the projected feed consumed by weight gain during the feeding period provides an estimate of feed efficiency. This information can be used by beef herd owners in selecting for animals which use feed more efficiently, resulting in a lower cost of gain to reach a given market target. Selecting for feed efficiency in the growing cattle should also lead to improvement in feed efficiency by the cowherd.

The steers in this program ate less feed for each pound of gain compared to the heifers (6.3 lbs. vs. 6.5 lbs.,  $p < .01$ ). Generally fat animals eat more feed per pound of gain than lean animals. Even though the average steer carcass contained more fat as measured by Yield Grade (3.1 vs 2.7), his rate of gain was much greater than that of the average heifer (ADG 3.5 vs 3.1 lbs.). Therefore the pounds of feed consumed was spread over more pounds of bodyweight resulting in reduced feed required for the weight gained.

**Carcass Performance.**

Carcass performance of the cattle is detailed in Table 3. The average steer carcass weighed 808 lbs., with a wide range of 592 lbs. to 968 lbs. Heifers produced an average 697 lb. carcass with a range of 480 to 907 lbs.

Table 3. Carcass Performance of Steers and Heifers in 1999/2000 New York Feedlot and Carcass Value Discovery Program.

Item	Average	Min.	Max.	Average	Min.	Max.
	STEERS (123 hd.)			HEIFERS (47 hd.)		
Hot carcass weight, lb.	808	592	968	697	480	907
Dressing percent	63.3	55.7	68.2	63.4	57.0	67.8
Ribeye area, sq. in.	13.1	10.2	17.1	13.2	10.3	17.4
REA/cwt HCW	1.6	1.3	2.2	1.9	1.6	2.3
Backfat, in.	.52	.20	1.10	.50	.25	.80
Yield grade	3.1	1.6	5.2	2.7	1.2	3.7
% Choice	69			70		
% Select	31			28		
% Qualifier						
% Dk and Std						
% YG 4	7.5			0.0		
% <600 lb HCW	0.7			6.4		
% >950 lb. HCW	3.4			0.0		

Five percent of the steer carcasses and 6% of the heifer carcasses were discounted due to being under or over weight (Figure 4). While not discounted, most packers would prefer a carcass that weighed 650 lbs. to 850 lbs. Only 59% of the steers met this preferred weight, while 73% of the heifers fit. As with final liveweight, heifers met the ideal target more often than did

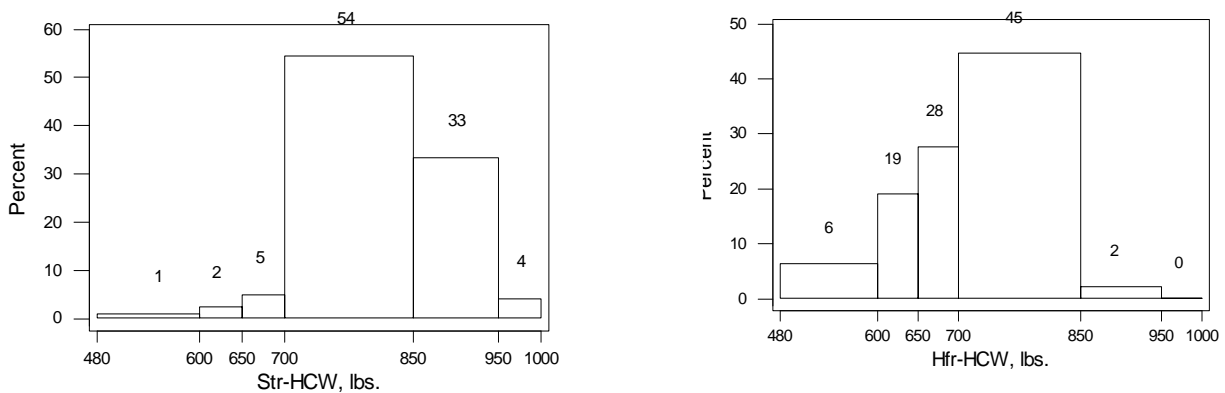


Figure 4. Hot carcass weight of steers and heifers consigned to NY Value Discovery Program. 1999/2000

the steers.

Yield grade (YG) is an estimate of the percentage of boneless, closely trimmed, retail cuts

(BCTRC). It is presented on a scale of 1-5, with a YG1 having more BCTRC than a YG5. It is calculated using hot carcass weight, backfat, ribeye area and internal fat. The steers were not statistically different from the heifers in backfat, ribeye area or internal fat. The heifers produced the same amount of muscle as measured by ribeye area, on a smaller carcass. Therefore, on a percentage basis they should produce more BCTRC, and thus a more desirable YG. This in fact was the case. The YG of heifers and steers was 2.7 and 3.1, respectively.

performed similarly to steers. In this set of cattle, the heifers outperformed the steers by producing carcasses which graded over 71% Choice, while the steers graded Choice only half the time. The Qualifier grade is placed on those cattle that are eligible for the Japanese market and a corresponding premium. Heifers usually don't make this grade, and this group was no exception. Discounts for dark cutters, Standard quality grade, Yield Grade 4's and underweight carcasses, can be as high as \$.20/lb. The heifers produced carcasses with a greater percentage of these discounts than did the steers.

## 2. Economic Performance.

The economic performance of the Value Discovery cattle is described in Table 4. Feed cost of gain is the dollars of feed it took to produce one pound of gain. At \$.29/lb. of gain, these steers and heifers would be profitable in most markets. Total cost of gain includes feed cost, but

Table 4. Economic Performance of Steers and Heifers in 1999/2000 New York Feedlot and Carcass Value Discovery Program.

Item	Average	Min.	Max.	Average	Min.	Max.
	STEERS (118 hd.)			HEIFERS (42 hd.)		
Feed cost of gain, \$/lb.	.29	.25	.35	.29	.24	.32
Total cost of gain, \$/lb.	.48	.41	.76	.49	.43	.64
Price received, \$/lb.	1.03	.87	1.12	1.01	.84	1.08
Feeder value (unadj.) <sup>1</sup> , \$/lb.	.84	.50	1.15	.78	.55	.97
Profit/loss (unadj.) <sup>1</sup> , \$/hd	71.45	-137.15	217.45	80.63	-63.83	210.13

<sup>1</sup>Value unadjusted for the range in price received over the harvest period.

also a yardage fee which covers labor, facilities, and other overhead costs. Added to that are charges for vet, medicine, trucking and marketing. Again, if total cost of gain can be kept under \$.50/lb gain, cattle feeding will be a profitable venture. What is instructive is the range in costs. The steer that costs \$.76/lb. gain will be profitable in only a few markets. Price received reflects the market price for Choice, YG 1-3 steers, weighing 600-949 lbs. Anything other than that is discounted. These discounts will vary throughout the year. Table 5 lists the discounts encountered during the time these cattle were marketed. These discounts are additive, so carcasses which fall outside the given criteria are severely discounted.

Table 5. Discounts applied to carcasses not meeting given criteria in the 1999/2000 NY Value Discovery Program, March-June, 1999.

Grade/Description	Discount, \$/lb.
Heifer	0.02
Select	0.05

Standard	0.17
Yield Grade 4-5	0.12
Carcass > 950 lb.	0.20
Carcass < 600 lb.	0.10
Dark cutter	0.20

As mentioned earlier, cattle that qualified for the Japanese market earned a premium. This premium ranged from \$.005-.02/lb.

The value of the feeder calf consigned to the Value Discovery program is determined by the following equation:

$$\frac{\text{Total Receipts} - \text{Total Costs}}{\text{Initial weight of calf}}$$

This is the amount per pound that could be spent on this calf and still cover all costs. It is truly the value of that calf. On average, the steer with an initial weight of 625 lbs. was worth \$.84/lb. Likewise, the average heifer was worth \$.78/lb, at 573 lbs. In other words, retaining ownership of these cattle netted \$.84/lb and \$.78/lb for the steers and heifers respectively. Or, looking at it from the cattle buyers perspective, \$.84/lb is all that could be paid for the steers, and still cover the total cost of feeding.

Finally, to determine the net profit/loss, a value was placed on the feeder calf based on prices received at the 1998 New York Beef Producers Tele-Auction, held at the Empire Livestock Facility in Bath on October 31, 1998. At this sale 550 lbs. steers averaged \$.75/lb. and the same weight heifers averaged \$.66/lb. To correct for calves not weighing exactly 550 lbs., for every 100 lbs. over 550 lbs. the price was decreased \$.04/lb. If the cattle were lighter, the price was increased \$.04 for every 100 lbs. below 550 lbs. After paying all feedlot and marketing costs, the net return on the average steer was \$71/head and \$81/hd on the heifers over returns if the cattle had sold at these Tele-Auction prices. The average steer performed exceptionally well, yet the range in profit from top to bottom was over \$350/head. One owner made \$217.45 on his steer, while another lost \$137.15.

#### **D. Discussion.**

##### 1. Sorting by profit.

To better understand the data generated by the program, pertinent information from the steers was summarized. Using profit as a key variable, the data set was sorted into thirds, the top third being the most profitable and the bottom third the least profitable. The data from this sort is presented in Table 6.

Table 6. Performance of Steers Sorted into Thirds by Adjusted Profit in 1999/2000 New York Feedlot and Carcass Value Discovery Program.

Item	Top	Middle	Bottom
No. head	40	39	39
In weight, lb.	651	638	584
Finish weight, lb.	1334	1263	1216
ADG	3.9	3.7	3.4

F/G, lb.	5.8	5.8	5.8
Hot carcass weight, lb.	855	798	747
Ribeye area, sq. in.	13.8	13.3	13.0
Backfat, in.	.5	.5	.4
Yield grade	3.0	3.0	2.7
% Choice	73	51	26
Feed cost of gain, \$/lb.	.29	.29	.29
Total cost of gain, \$/lb.	.46	.47	.50
Price received, \$/lb.	1.05	1.04	1.02
Total feedlot costs, \$/hd.	313	293	315
Feeder value (adj.), \$/lb.	.90	.85	.77
Profit/loss (adj.), \$/hd <sup>1</sup>	122	80	16

<sup>1</sup>Uniform discounts were added to a base price for Choice, YG1-3 cattle. This removes the impact of the variation of price over the harvest period.

The steers in the most profitable third earned \$122/head. That's \$42/head more than the middle third and more than \$100/head above the bottom third. Scanning down through the data, several factors stand out. The most profitable steers had:

- 1) heavier finish weights
- 2) greater ADG
- 3) heavier carcass weights
- 4) higher dressing percentages
- 5) larger ribeye areas
- 6) more Choice quality grade
- 7) lower Total cost of gains.

The main differences affecting profits include heavier carcasses, higher daily gain, and a higher average % choice. Since returns were above the break even sale price, selling as much weight as possible without discount increased profit. The higher % choice further increased their advantage (selling more weight and at a higher price). Since all three groups averaged a similar degree of fatness when sold (as evidenced by their backfat and yield grade) this higher grade appears to be related to genetic differences. Feed efficiency and yield grade was similar across the three groups, suggesting they were fed during similar stages of growth. However, the highest profit group had a lower non-feed cost of gain, because of a fixed daily yardage charge per head and their faster daily gain.

## 2. Comparison with other programs and the ideal.

How does the feedlot and carcass performance of cattle consigned to NY Value Discovery compare to performance of other cattle in similar programs? How do they compare to the ideal steer? The Texas A&M Ranch to Rail program is a long running program evaluating the feedlot and carcass performance of steers in Texas. The National Cattlemen's Beef Association conducts periodic audits of the beef industry. From this audit, characteristics of the ideal steer can be drawn. Table 7 lists characteristics from each program and contrasts them to the performance of cattle in the NY Value Discovery program.

Table 7. Performance of Steers in Texas Ranch To Rail, NY Value Discovery Program and Ideal Values (1999/2000).

Item	Texas Ranch to Rail	NY Value Discovery	Ideal
IWt, lbs.	609	625	
FWt, lbs.	1134	1271	1050-1200
DOF	172	176	>120
ADG, lbs.	3.04	3.7	>3.0
V&M, \$/hd.	\$2.85	\$8.08	\$0
FCOG, \$/cwt.	\$45.81	\$28.77	
TCOG, \$/cwt.	\$53.11	\$46.81	
HCW, lbs.	727	801	650-750
%Ch	39	50	70
%YG 2	82	46	70
BF, in.	.34	.47	.25-.45
REA, in. <sup>2</sup>	13.7	13.4	11-13
REA/cwt.	1.90	1.67	1.8-2.2
P/L, \$/hd.	\$71.10	\$71.45	

Cattle delivered to the NY Value Discovery program tended to be heavier at delivery (IWt) and at harvest (FWt) compared to Texas and the ideal harvest weight. Feedlot and economic performance was excellent. ADG was 3.7 lbs. compared to 3.04 for Texas, and both feed and total cost of gain was lower than the Texas average. Health of local cattle does need to be addressed, as the average cost for vet and medicine for NY fed cattle was nearly three times that of Texas fed cattle. Heavy harvest weights lead to heavy carcass weights and NY Value Discovery cattle exceeded the Texas cattle and were outside the limits of the ideal steer on a national basis. Other carcass characteristics also need to be addressed. Quality grade, yield grade, backfat thickness, and ribeye area are all areas that owners of local cattle need to be monitoring. While NY fed cattle had heavier carcasses, lower cost of gain and a higher % Choice, profits were on par with the Texans. This is due to the fact that NY feeder cattle were valued at \$72.50/cwt weighing 625 lbs. and calves delivered to Ranch to Rail program weighing 609 lbs. were only valued at \$63/cwt. The price received for finished cattle was \$1.03 and \$1.01 for NY and Texas fed cattle, respectively.

Carcass performance is an area that needs attention if cattle originating in the northeast are to be competitive in a value based marketing system. Sorting the database of steers and heifers and comparing the average gives a telling story. Table 8 lists the results of this sort.

Table 8. Number And Percentage Of Steers And Heifers In 1998/99 NY Value Discovery Program Meeting Ideal Specifications For Carcass Traits.

Carcass Trait	Ideal	NY Value Discovery	
		Steers, no.	Heifers, no.
Ch, YG 2	100%	22 (19%)	13 (31%)
HCW, lbs.	650-800	13 (11%)	11 (26%)
BF, in.	.25-.45	6 (5%)	7 (17%)
REA, in. <sup>2</sup>	11-13	2 (2%)	3 (7%)

Only two steers and three heifers produced the ideal carcass. Our % choice was higher but they were more fat. That's after increasing the acceptable HCW from 750 lbs. to 800 lbs. As producers select sires, carcass traits for increased marbling, increased ribeye area, and decreased backfat, must be given a high priority if cattle are to compete in future value based markets.

## **E. Summary**

Using a report card to evaluate the average performance of steers and heifers fed in this year's program provides an easy to understand overview (Table 9).

Table 9. Report card on feedlot, carcass and economic performance segments of cattle consigned to the 1998/99 NY Value Discovery Program.

<b>Segment</b>	<b>Grade</b>
Feedlot	B
Carcass	C
Economic	B

Feedlot performance and the cost of gain continue to areas where cattle produced in the northeast excel. Average daily gain and feed efficiency, along with cost to put on that gain are well above industry averages. However, cattle in this program were deficient in meeting carcass traits deemed ideal by the industry. Owners of these cattle need to place a greater emphasis on carcass traits such as increasing marbling (major factor in determining Quality grade), and ribeye area while decreasing backfat. While selecting for these traits, hot carcass weights must not be allowed to increase above current levels. Fortunately carcass traits have a high heritability and improvement can be made quickly.

Producers in this program are to be commended for taking the initiative and the risk to participate in this program. The information that they gather will allow them to determine whether they are on target or if they need to make changes in their breeding program. As they do, these producers will be well positioned to take advantage of value based markets as they become available.

### Literature Cited

Perry, T. C. and D. G. Fox. 1997. Predicting carcass composition and individual feed requirement in live cattle widely varying in body size. *J. Animal Sci.* 75:300.

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