

2003 Summary of the Five State Beef Initiative in Kentucky

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Introduction

The Five State Beef Initiative (FSBI) continues to be a successful program among Kentucky producers in helping them obtain detailed feedlot and carcass data on their cattle. A large number of calves born in 2001 were tagged with electronic identification tags and tracked through the feedlot and packing plant. Carcass data obtained show that Kentucky feeder cattle perform quite well and in most situations are above industry average, as reported in the 2000 National Fed Cattle Audit. This information can be beneficial to cow-calf producers, allowing them to make necessary genetic or management changes when called for and to target specific markets for their cattle. Additionally, the project has provided a unique opportunity to develop a large database of feedlot and carcass performance on Kentucky feeder calves that has proven useful in marketing efforts.

Program Description

Over the course of late 2002 and early 2003, carcass data were received on 1,598 feeder calves born in 2001 and marketed to feedlots in fall 2001 and spring 2002. The majority of calves (68%) came from five certified pre-conditioned for health (CPH) sales in two locations. Another 17% came from independent producers able to market uniform load lots of cattle. The remaining 15% came from two small producer groups that commingle their calves and market directly to feedlots. Of the 1,598 sets of carcass data received, 58% were steers and 42% were heifers.

These calves represent a broad sample of Kentucky feeder cattle from various geographic, genetic, and pre-weaning management backgrounds. However, all calves were managed post-weaning according to Kentucky's CPH-45 program guidelines.

The average, minimum, and maximum values for carcass data are shown in Table 1. The average carcass had a marbling score of Small 60 indicating a quality grade of low Choice. The average ribeye area of 13.6 square inches was right on target for the average hot carcass weight of 827 pounds. Average backfat of 0.57 inches is slightly greater than the average of 0.51 inches for similar cattle from the NBQA-2000 survey and

Table 1. 2003 carcass data summary.

	Hot Carcass Wt.	Backfat	Ribeye Area	Yield Grade	Quality Grade	Marbling Score
Average	827	0.57	13.6	3.22	Choice-	SM 60
High	1173	1.60	24.8	6.44	Prime	MDA 20
Low	536	0.08	8.3	0.08	Standard	TR 0

is within standards for the industry. The average carcass had a yield grade of 3.2. These average values indicate high market acceptability for Kentucky cattle; however, the need to remove carcasses that will receive discounts and that have reduced value is also apparent.

Carcass quality and yield grades for Kentucky Five State Beef Initiative (KY FSBI) cattle are compared to data from the 2000 National Fed Cattle Audit in Figures 1 and 2, respectively. Kentucky FSBI cattle produced more Prime and Choice carcasses and fewer Select and Standard grade carcasses (Figure 1) compared to the audit cattle. The "Other" category is used to describe undesirable quality grades such as Commercial or Utility, dark cutters, blood splash, or an animal being graded a "C" maturity.

More than 69% of the Kentucky cattle graded Choice or better compared to 51% for the fed cattle audit. Only 1.7% of Kentucky calves produced Standard grade carcasses, while 5.6% of carcasses in the fed cattle audit graded Standard.

Figure 1. Carcass quality grade summary.

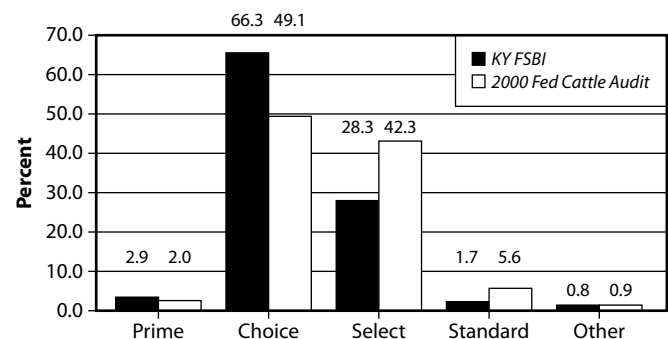
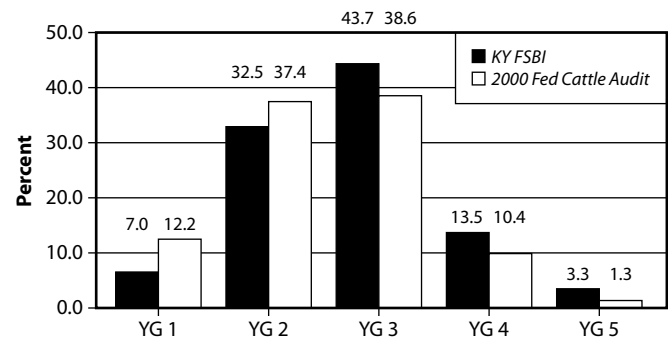


Figure 2. Yield grade summary.



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On average, Kentucky calves produced carcasses with higher yield grades. Kentucky FSBI cattle produced fewer yield grade 1 and 2 carcasses while producing more yield grade 4 and 5 carcasses than cattle in the fed cattle audit. Cattle were fed to heavier weights than in previous years, resulting in both higher quality and yield grades. However, 85% of the Kentucky carcasses yield graded 3 or better.

Finally, it is interesting to examine how many calves would have qualified for premiums such as CAB or Sterling Silver. To qualify for these programs and earn the associated premiums, a carcass must grade in the upper two-thirds of the Choice grade and receive a yield grade no higher than 3. In 2002, greater than 19% of Kentucky FSBI calves would have qualified for such a program.

Quality and yield grade distributions for Kentucky FSBI steers are shown in Figures 3 and 4 and for heifers in Figures 5 and 6. Steers graded 68.9% Prime and Choice, with only 1.3% falling into the Standard grade. Data in Figure 4 reveal an undesirable number of steer carcasses (18.8%) falling into yield grades 4 and 5. Heifers were similar to steers in the percentage of carcasses grading Prime and Choice (69.8%) but had a higher percentage of carcasses grading Standard or Other (4.2%) compared to steers. Heifer carcasses had a greater percentage of yield grades 1 and 2 (45.4% versus 35.2%) and lower percentage of yield grades 4 and 5 (14.4% versus 18.8%) compared to steer carcasses.

Figure 3. KY FSBI steers—quality grades.

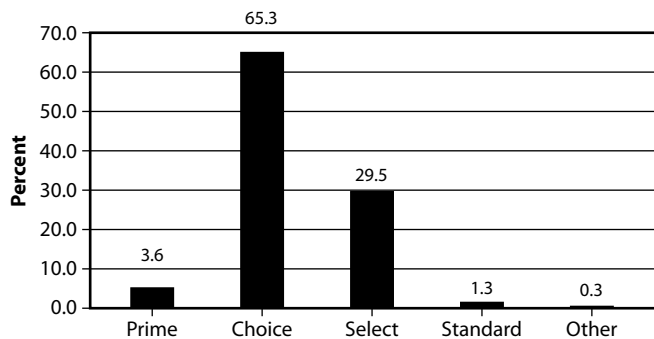


Figure 4. KY FSBI steers—yield grades.

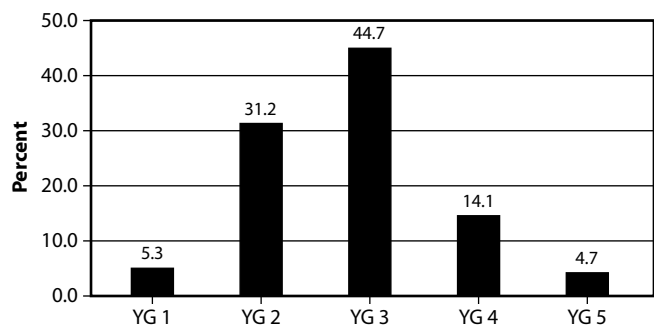


Figure 5. KY FSBI heifers—quality grades.

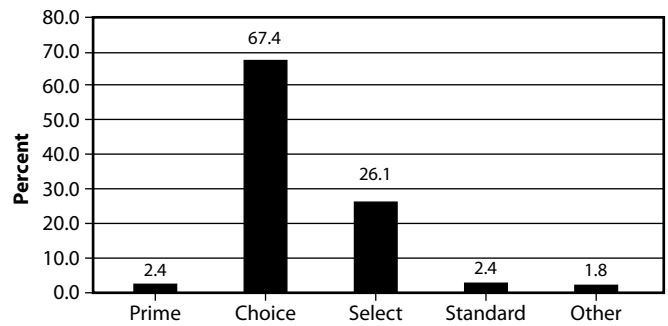
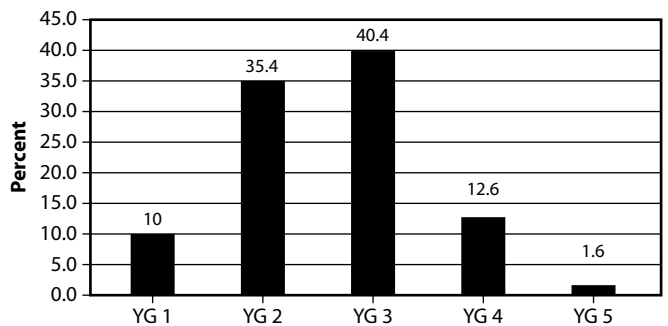


Figure 6. KY FSBI heifers—yield grades.



Carcasses given a yield grade of 4 or 5 receive a significant discount in price. Producers need to understand why cattle receive these undesirable yield grades to determine if farm-level management can change this problem. Genetic factors as well as overfeeding on the part of the feedlot impact the percentage of high yield grade cattle. Understanding the USDA yield grade equation will help determine responsibility for the problem.

Components of Yield Grade

The USDA yield grade equation has three components. The first component is the preliminary yield grade based on the amount of backfat at the 12th rib at slaughter. A carcass with no backfat receives a preliminary yield grade of 2.0. Each additional tenth of an inch of backfat increases the preliminary yield grade by 0.25. For example, a carcass with 0.6 inches of backfat would receive a preliminary yield grade of 3.5.

The second component of the equation is the relationship between hot carcass weight and ribeye area in square inches. A carcass that weighs 500 pounds has a required ribeye area of 9.8 inches. For each 100-pound increase of hot carcass weight, the required ribeye area increases by 1.2 square inches, i.e., a 700-pound carcass would require a 12.2-square-inch ribeye. For every square inch that the measured ribeye area is less than the required ribeye area, 0.3 is added to the preliminary yield grade. For every square inch that the measured ribeye area is greater than the required ribeye area, 0.3 is subtracted from the preliminary yield grade.

Table 2. Yield grade 5 carcasses (steers and heifers).

	Yield Grade	Backfat	Hot Carcass Wt.	Ribeye Area	KPH
Average	5.40	1.17	984	13.3	2.47
High	6.44	1.6	1172	15.9	4.0
Low	5.00	0.8	713	8.3	1.5

Table 3. Yield grade 4 carcasses (heifers only).

	Yield Grade	Backfat	Hot Carcass Wt.	Ribeye Area	KPH
Average	4.41	0.88	837	12.69	2.74
High	4.97	1.2	996	15.4	4.0
Low	4.00	0.52	659	8.7	2.0

Table 4. Yield grade 4 carcasses (steers only).

	Yield Grade	Backfat	Hot Carcass Wt.	Ribeye Area	KPH
Average	4.39	0.84	927	13.25	2.44
High	4.97	1.40	1114	18.4	4.0
Low	4.00	0.42	647	8.8	1.5

The third component of the equation is determined by the amount of internal or kidney, pelvic, and heart (KPH) fat present within the carcass. An average carcass has a KPH value of 3.5%. For each percent greater than 3.5%, 0.2 is added to the preliminary yield grade. For each percent lower than 3.5%, 0.2 is subtracted from the preliminary yield grade. Most cattle, including the Kentucky FSBI cattle, have KPH measurements less than 3.5%. Most yield grade 4 and 5 carcasses are the result of excessive backfat. A contributor to undesirable yield grade is also having a ribeye smaller than the required size for carcass weight. Internal fat deposition, while a part of the yield grade equation, has little practical significance in causing a carcass to have an undesirable yield grade.

Forty-one steers and 11 heifers had a yield grade of 5. Overfeeding is the normal cause of a yield grade 5. The best indicator of overfeeding is the amount of backfat present on the carcass at the time of slaughter. Animals are usually slaughtered with backfat ranging from 0.3 inches to 0.7 inches. The average amount of backfat on all 2003 Kentucky FSBI calves was 0.57 inches.

The average amount of backfat on the 11 heifers was 1.17 inches and 1.18 inches for the 41 steers. The least amount of backfat any of the yield grade 5 carcasses had was 0.8 inches, with the majority having greater than 1 inch of backfat. This is an excessive amount of backfat and shows that these animals were fed too long, creating the high number of yield grade 5 carcasses (see Table 2).

In this data set, 127 steers and 80 heifers received a yield grade of 4. Fifty-nine of the 80 heifers had 0.8 inches or greater of backfat, indicating overfeeding. However, a majority of the heifers also had a smaller ribeye area than the amount required for their hot carcass weight to avoid an upward adjustment in yield grade. Average hot carcass weight of the heifers was 837 pounds, requiring a ribeye area of 13.84 square

inches. The average ribeye area for the 80 heifers was 12.69 inches, or greater than 1 square inch less than the required amount. Fourteen of the 80 heifers had ribeye areas more than 2 square inches less than required for their hot carcass weight (see Table 3).

Seventy-eight of the 127 steers receiving a yield grade 4 had 0.8 inches or greater of backfat. Similar to the heifers, however, many also had a smaller than required ribeye area. The average hot carcass weight for these 127 steers was 928 pounds, requiring a 15-square-inch ribeye. The average ribeye for the 127 steers was 13.25 square inches, 1.75 square inches less than the amount required. Forty-eight of the 127 steers had a ribeye area greater than 2 square inches smaller than the amount required, while an additional 12 had a ribeye area greater than 3 inches smaller than the amount required for hot carcass weight (see Table 4).

These steers and heifers received high yield grades primarily due to two factors. The majority were overfed, resulting in excessive backfat. In addition, several had a much smaller ribeye area than the amount required for the hot carcass weight. Both factors contributed to significant discounts in value for these yield grade 4 and 5 carcasses.

Impact

Currently, greater than 50% of all finished cattle in the United States are marketed on some type of grid. The grid analysis that follows is only intended to help place economic values on the carcass data received. It is not meant to imply that these figures are actual returns and/or premium and discount levels for Kentucky calves in the Five State Beef Initiative.

The USDA Direct Slaughter Cattle Premiums and Discounts report was used as the value-based system for these cattle. This report is published on a weekly basis by the USDA Market News Service and is considered to provide an average of all grids. The report for the week of July 7, 2003, was used in conducting this analysis. Value adjustments in this report are shown in Table 5.

This premium and discount schedule was used to determine a value for all 1,598 Kentucky FSBI cattle. As expected, there was great variation in the value of the cattle. The carcass earning the greatest premium level per hundredweight was a heifer with a quality grade of Prime and a yield grade of 2.96. This carcass earned a premium of \$7.45 per hundredweight, or \$54 total. The carcass with the greatest discount had a quality grade of Select, a yield grade of 4, and a carcass

Table 5. National direct slaughter cattle—premiums and discounts, June 7, 2003.

Quality Grade	Premium/Discount	Yield Grade	Premium/Discount	Hot Carcass Wt.	Premium/Discount
Prime	\$6.07	1.0-2.0	\$2.92	400-500	(\$24.08)
Avg. Choice	2.08	2.0-2.5	1.79	500-550	(16.17)
Choice	0.00	2.5-3.0	1.38	550-600	(4.08)
Select	(10.40)	3.0-3.5	0.00	600-900	0.00
Standard	(18.73)	3.5-4.0	0.00	900-950	(1.25)
Hard bone	(23.92)	4.0-5.0	(13.18)	950-1000	(7.83)
Dark cutter	(28.13)	5.0 and up	(18.31)	Over 1000	(18.67)

weight greater than 1,000 pounds. This carcass was discounted \$47.38 per hundredweight, or more than \$500 total.

A comparison of the top 25% and the bottom 25% of the cattle is shown in Table 6. The top 25% received a \$2.37 average premium per hundredweight, or an average total premium of \$18.66 per head. The bottom 25% received an average discount of \$20.40 per hundredweight, or \$191.49 per head.

There is only a small difference in quality grade, less than one marbling score between the top 25% and the bottom 25%. Both groups were in the Choice quality grade. There were Choice and Prime carcasses in the bottom 25%. This suggests that quality grade may not be the primary factor in determining the value of animals sold on a grid. Factors accounting for carcass discounts as discussed below may be more important.

Hot carcass weight was quite different for the two groups. Average hot carcass weight for the bottom 25% was 130 pounds heavier than the top 25%. Of the 400 carcasses in the bottom 25%, 236 received discounts due to excessive hot carcass weight. One hundred and thirty of these carcasses were over 1,000 pounds and received sizable discounts.

An additional factor was the amount of yield grade 4 and 5 discounts received among the bottom 25% of the carcasses. On average, there was an entire yield grade difference between the top 25% and the bottom 25%. Within the bottom 25%, 242 carcasses out of 400 received discounts for being a yield grade 4 or 5.

This grid exercise was not intended to downplay the quality of cattle in the data set. It was discussed earlier that Kentucky cattle exceeded industry averages in many areas. Rather, the intent is to show the wide variation existing among the cattle. This variation in premium and discount levels drives home the importance of knowing something about the cattle being fed.

This grid exercise also makes clear the importance of marketing cattle through the appropriate channels. If the upper 25% of these cattle had been sold on a live weight basis, which would be similar to the grid price levels drawing no premium or discount, the feedlot operator would have been losing significant premiums (Table 6, \$18.66 per head) that could have been obtained. However, if the feedlot operator had sold the bottom 25% on a grid such as the one used in this analysis, a large dollar loss (Table 6, \$191.49 per head) would have been the result.

Of the 1,598 calves that were included in this hypothetical grid-pricing analysis, 859 received discounts, while 489 received premiums. If those cattle receiving premiums had been sold on a grid like the one used in the analysis, they would have returned \$16.67 per head above the base price of the grid. On the other hand, if those cattle receiving discounts had been sold on a grid, they would have lost an average of \$124.37 per head below the base price of the grid (Table 7). This clearly shows how valuable carcass data can be to those feeding cattle. If there is historic data of how cattle would grade, they could be marketed in the most appropriate way to greatly increase returns per head.

Given the large range of values shown in this simple analysis, it is clear that cattle feeders should be willing to pay more for the right type of cattle. Hopefully, this work has also shown the value of having carcass data. Even if the quality of the Kentucky FSBI cattle were unchanged, knowing something about how they would perform on the rail could have eliminated costly marketing mistakes. The higher quality cattle could have been targeted to a quality-based grid, and the poorer quality cattle could have been sold through other means.

Summary

Cow-calf operators and backgrounders who sell feeder calves should know what type of cattle they have. Imagine how much different this grid analysis would have been if the bottom 25% had been excluded. Individual producers have the ability to do this for their operation. Programs such as the Five State Beef Initiative allow producers to receive detailed feedlot and carcass data on their cattle so that, over time, this information can be used to cull cows and/or bulls that cost the beef industry large sums of money each year. By removing these outliers and documenting calf performance, cow-calf producers may be able to command superior prices for their cattle and target them toward markets that were not previously attainable.

Table 6. Grid pricing analysis of 1,598 KY FSBI calves.

	Carcass Wt.	Marbling Score	Yield Grade	Premium/Discount/Cwt.	Premium/Discount/Head
Top 25%	792.3	MT23	2.90	\$2.37	\$18.66
Average	827.2	SM56	3.22	(6.87)	(61.75)
Bottom 25%	921.4	SM55	3.92	(20.40)	(191.49)

Table 7. Cattle earning premiums vs. cattle earning discounts.

	Premium/Discount per Cwt.	Premium/Discount per Head
Cattle earning premiums	\$2.11	\$16.67
Cattle earning discounts	(13.98)	(124.37)