

Trends Associated with Marbling Score, Fat Cover, and CAB (Certified Angus Beef™) Acceptance Rate

A.S. Leaflet R1758

Mark F. Scott, graduate student
Doyle E. Wilson, professor of animal science
Gene H. Rouse, professor of animal science

Summary

The objective of the study was to analyze the Certified Angus Beef (CAB) program carcass database for trends associated with marbling score, fat cover, and CAB acceptance rate in Angus-type cattle. The CAB program carcass database is made up of over 100,000 records collected during 1989 to 1999. Steers make up 90 % of the database, and 89 % of the cattle were finished in the Midwest (NE, CO, KS). The majority of the cattle (62 %) were finished in Nebraska feedyards. The CAB program overall acceptance rate was 23.4 %. Marbling score (84.0 %) is the first limiting factor for CAB acceptance of steers. For steers, a combination of marbling score and yield grade (8.3 %) and yield grade alone (6.1 %) for steers are the second and third limiting factors for CAB acceptance, respectively. The phenotypic correlation between fat cover and marbling score is nearly zero for CAB steers, yet for non-CAB steers the correlation is 0.38 ($p < .01$). On the average, as yield grade increases from 2.0 to 4.0, by each tenth of a unit, marbling score increases by 0.3 % for every 1 % increase in fat cover for all steers. Comparing CAB steers versus non-CAB steers, marbling score increases by 0.05 % and 0.34 % for every 1 % increase in fat cover, respectively. As fat cover groups increase by 0.1 of an inch, CAB acceptance rate increases up to the 0.6-0.69 inch group, then starts to decrease for steers. When looking at marbling score by fat cover groups, CAB steers increase 1.0 % for each 0.1 inch increase in fat cover, and for non-CAB steers, there is an increase of 5.0 %. Fat cover increases by 5.6 % and 14.2 % as you go from a USDA marbling score of small to modest and slight to modest, respectively, for all steers. Looking at the slaughter months, there is an increase in marbling score from April to August, although fat cover remains steady. Yet CAB acceptance rate decreases from April to June and then increases from June to November. Producers may be able to improve the CAB acceptance rate of their cattle if there is a clearer understanding of the relationship between traits that are included in the CAB specifications.

Introduction

Finishing cattle with a high-quality, consistent end product in mind is a tall order. One must consider genetic background, age, sex, environment, and many other factors that affect how cattle are to be finished. Feeders often are tempted to feed cattle longer when feed and cattle slaughter prices are low; they hold on to cattle longer anticipating price improvement. Some cattle feeders who feed cattle longer, which increases fat cover, assume marbling will substantially increase.

The Certified Angus Beef™ Program is built on providing the consumer with a high-quality, consistent, flavorful eating experience. CAB has designed their program specifications to find cattle that will meet these consumer expectations. Marbling is the single most limiting factor in certification of carcasses for CAB; however, not meeting the yield grade specification of a 3.99 or better affects 10-14 % of the cattle. Fat cover is the major driving force behind the USDA yield grade prediction equation. The objective of this study was to analyze the CAB program carcass database for trends associated with marbling score, fat cover, and CAB acceptance rate in Angus-type cattle.

Material and Methods

The CAB program carcass database is made up of over 100,000 carcass records collected during 1989 to 1999. Carcass traits that included CAB specification traits and the final overall certification grade have been recorded in the carcass database. Data were analyzed using Microsoft Access and SAS procedures.

Results and Discussion

Steers make up 90 % of the database, and 89 % of the cattle were finished in the Midwest (NE, CO, KS). The majority of the cattle (62 %) were finished in Nebraska feedyards. The CAB program overall acceptance rate was 23.4 %. In order to further document management practices, the ability to predict major factors affecting CAB acceptance is important. Marbling score (84.0 %) is the first limiting factor for CAB acceptance of steers. A combination of marbling score and yield grade (8.3 %) and yield grade alone (6.1 %) are the second and third limiting factors for steer CAB acceptance, respectively.

The average marbling score for CAB steers is 472 ± 74 while non-CAB steers average 323 ± 70 . Fat cover on the average for both CAB steers and non-CAB steers is 0.53, with a standard deviation of 0.12 and 0.17, respectively. The phenotypic correlation between fat cover and marbling

score is nearly zero for CAB steers, yet for non-CAB steers the correlation is 0.38 ($p < .01$). CAB steers have a genetic potential to achieve a higher mean level of marbling than non-CAB steers. In other words, CAB steers have more marbling, but not at the expense of adding more fat cover.

Figure 1 compares CAB steers with non-CAB steers by looking at how marbling score is affected as yield grade increases from 2.0 to 3.9. The marbling score average for groups of CAB steers that were slaughtered with a yield grade of 2.0 is 462 ± 65 (.32 \pm .10 inches of fat cover), and for those slaughtered with a yield grade of 3.9 it is 481 ± 80 (.67 \pm .09 inches of fat cover). Likewise, non-CAB steers slaughtered with a yield grade of 2.0 versus 3.9 have marbling score averages of 281 ± 62 (.32 \pm .09 inches of fat cover) and 327 ± 49 (.67 \pm .09 inches of fat cover), respectively. As yield grade increases from 2.0 to 4.0, by each tenth of a unit, marbling score increases by 0.3 % for every 1 % increase in fat cover on the average for all steers. Comparing CAB steers versus non-CAB steers, marbling score increases by 0.05 % and 0.34 % for every 1 % increase in fat cover, respectively.

There are a significant number of steers that are certified when looking at yield grades from 2.0 to 3.9 by tenths of a unit. For example, the percentage of steers certified at yield grade 2.0 is 11 %, as illustrated in Figure 1. Again, when looking at yield grades 2.5, 3.0, and 3.5, the percentage of certified steers are 18 %, 26 %, and 33%, respectively. These significant numbers of steers that are certified from yield grades 2.0 to 2.9 are due to the genetic potential for a higher mean level of marbling and to proper management with respect to fat cover while in the feedlot.

As fat cover groups increase by 0.1 of an inch, CAB acceptance rate increases up to the 0.6-0.69 inch group, and then starts to decrease for steers. When looking at marbling score by fat cover groups that range from 0.2 to 0.89 of an inch, CAB steers increase in marbling 1.0 % for each 0.1 of an inch increase in fat cover, and for non-CAB steers, there is an increase of 5.0 %. Fat cover increases by 5.6 % and 14.2 % as USDA marbling scores progress from small to modest and slight to modest, respectively, for all steers.

Because slaughter price changes and the Choice-Select spread vary throughout the year, it is important to recognize trends for marbling score and fat cover by slaughter month. Looking at the slaughter months, there is an increase in marbling score from April to August, although fat cover remains steady. Yet CAB acceptance

rate decreases from April to June and then increases from June to November. Most cattle (84.5 %) are slaughtered between the months of April and August. This implies that most producers are on a spring calving schedule. At weaning time, calves either go directly to the feedlot or are backgrounded through the winter and possibly the summer months depending on grazing availability. Calf-fed cattle are slaughtered from 12 to 16 months of age and yearling-fed cattle are slaughtered from 16 to 22 months of age. If the assumptions we made through the interpretation of the data are correct, in terms of identifying CAB carcasses as calf-fed and yearling-fed, then it appears that yearling-fed cattle have some advantage in marbling score at slaughter time. Thus, yearling-fed cattle are an important part of the overall CAB acceptance rate.

Implications

Producers may be able to improve the CAB acceptance rate of their cattle if there is a clearer understanding of the relationship between traits that are included in the CAB specifications. The increased success of the CAB program depends on marbling score and yield grade, because they make up 98.4 % of the limitation to CAB acceptance in steers. Because fat cover is the driving force of the USDA yield grade prediction equation, learning to manage fat cover in the feedlot is important. Cow-calf producers, feeders, and alliances with a low or nonexistent CAB acceptance rate need to pay more attention to marbling EPDs in their genetic selection programs. Identifying cattle that have sufficient marbling at 11-12 months of age (approximate yield grade of 2.5) through the use of ultrasound will allow a feeder to send these cattle to slaughter before they add the extra fat cover. Understanding the economics of producing steers with a genetic potential to add marbling at a faster rate, and yet managing fat cover properly while the steers are in the feedlot will help producers and feeders improve their CAB acceptance rate.

Acknowledgments

The authors gratefully acknowledge the Certified Angus BeefTM Program for their financial support of their project.

Figure 1. Marbling score and CAB acceptance rate for steer types by yield grade.

