Why Most Cattle Don't Qualify for CAB®

*Lack of marbling leads failures, but qualifiers show potential
for upgrading genetics and management.*

BY STEVE SUTHER

You might call it a selling point: Only 8% of all fed cattle qualify for the *Certified Angus Beef™* (CAB®) brand. You also might call it a supply-development challenge. Availability of qualified live cattle is the most limiting factor to continued growth of the brand in the near term, says Larry Corah, vice president of Certified Angus Beef LLC (CAB).

Each year a higher percentage of fed cattle are marketed through some type of value-based grid formula, Corah says. Quality grade and CAB acceptance rate are major factors in the prices producers receive, and average premiums for CAB-qualifying carcasses set records again last year.

More than half of all fed cattle don't qualify because of insufficient Angus genetic influence. Last year, 46% of the fed cattle were Angus-type as determined by hide color.

"Angus producers have an obvious advantage in meeting the live specifications, and the 10.5 million eligible live cattle was up 11% from 1999. But with the acceptance rate of 18.3%, producers interested in the market premiums want to know why most black-hided cattle don't qualify," Corah points out.

To answer that question, in 1999 CAB entered into a research project with Iowa State University (ISU) animal scientists Gene Rouse and Doyle Wilson, along with graduate student Mark Scott, to analyze the carcass database collected by CAB since 1989.

Initial phase complete

In the first report from that three-part study, completed last November, Scott says his objective was to analyze the database of more than 100,000 carcass records for trends associated with marbling score, fat cover and CAB acceptance rate.

"Documentation of management practices that could enhance CAB acceptance would be a valuable aid for CAB-licensed feedlots," Scott notes.

Wilson sees Scott's work as "a great historical perspective that forms the foundation for the most important work that is yet to come — to start looking at the genetic merit of sires that have been used in that program." But he agrees the initial report contains management lessons.

The data were gathered for seedstock producers who wanted carcass information on the progeny of specific bulls (25% of the database) and commercial producers who wanted individual carcass information on their cattle. Steers make up approximately 90% of the database, and the majority of the cattle (62%) were finished in Nebraska feedlots.

Overall, the CAB acceptance rate for those cattle was 23.4%, compared to the 17%-20% acceptance rates for all evaluated cattle from 1989 to 1999, says Ron Bolze, CAB director of genetic programs. "The cattle in this database contain a higher percentage of Angus genetics than are represented in the total cattle mix in the United States," Bolze says. "That reflects the positive impact the right type of Angus genetics can have on CAB acceptance rates."

Lessons learned

Scott, Wilson and Rouse found that marbling and yield grade components of the eight CAB carcass specifications determined 98.4% of the reasons cattle don't qualify. By far, the biggest factor is lack of marbling;

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PHOTO BY TROY SMITH

Table 1: Total record allocation for why steers did not make CAB®

Area of insufficiency	No. of steers	% of steers
Marbling score	63,697	84.02
Marbling score & yield grade	6,275	8.28
Yield grade	4,644	6.13
Unexplained	1,083	1.43
Marbling score & dark cutter	66	0.09
Marbling score & bloodshot ribeye	17	0.02
Maturity	8	0.01
Dark cutter	6	0.01
Blood shot	4	0.01
Maturity, marbling score & yield grade	4	0.01
Marbling score, yield grade, dark cutter & bloodshot ribeye	2	0.00
Yield grade & dark cutter	2	0.00
Total non-CAB cattle record count	**75,808**	**100.00**

84% of the steers not qualifying had small (low-Choice) or lower levels of marbling (see Table 1 on page 105). The second-most-common shortcoming, 8.3%, is the broad combination of inadequate marbling and high yield grade (YG) score. Another 6.1% of steer carcasses had adequate marbling but did not qualify because they were YG 4 or higher.

The good news in the data is that both marbling and yield grade are greatly influenced by management and genetics. Regarding the latter, Wilson says, "We have known for some time that the genetic relationship between marbling and external fat is relatively low in Angus cattle. It is probably someplace between zero and 10%, meaning that we can select for one without antagonizing the other." In contrast, the correlation between marbling and external fat for steers that did not qualify for CAB in this database was a relatively high 0.38.

"We have to help the industry identify Angus sires that have the ability to put intramuscular fat into their progeny at an earlier age, before the animals start laying down excessive external fat," Wilson says. "We can still have quality and growth, but we don't have to have animals with 0.5-inch (in.) or more external fat. It would be nice to have the industry target of 0.35 to 0.4 in., and based on what we know of the genetics, we can do that."

Here are some specifics from the research analysis conducted by the ISU scientists.

Fat cover. Average fat cover for those cattle qualifying for CAB acceptance was identical to the fat cover on those that did not qualify (0.53 in.). Wilson says that implies cattle that qualified had the genetic propensity to marble, and feeding to higher levels of fat cover didn't help qualify for CAB.

That's not to say fat cover doesn't matter. Looking at the trend of how marbling score changes as cattle are grouped by fat cover ranging from 0.1 to 1.49 in. (see figs. 1 and 2). Scott reports that, for each 0.1-in. increase in fat cover, there was a 1% increase in marbling in steers qualifying for CAB.

However, in steers not qualifying, there was a 5% increase in marbling for each 0.1-in. increase in fat cover.

Yield grade. Yield grade, like marbling, is an important economic consideration in marketing cattle on a grid, Bolze says. "Ideally, we would like to have as many cattle in the YG 2 to 2.9 qualify for CAB as possible. Not only is this economically important to the producer, but it creates the ideal carcass for the foodservice, retail and international trade."

Eliminating all cattle that are YG 3.9 or

Table 2: Relationship between yield grade and CAB® acceptance

Yield grade	CAB® acceptance rate, %
2.5	11%
2.6	18%
3	26%
3.5	33%

Fig. 1: Percent of record allocation, by steer type, for fat cover
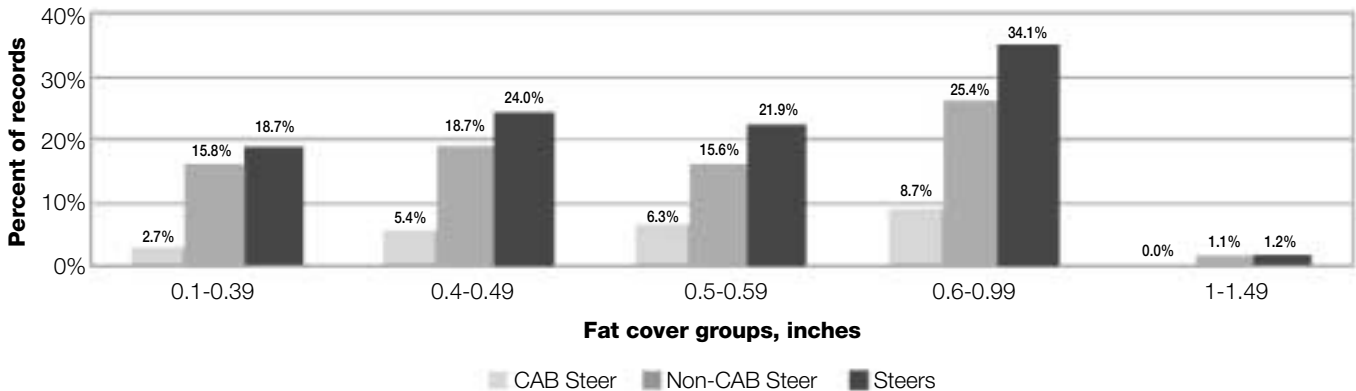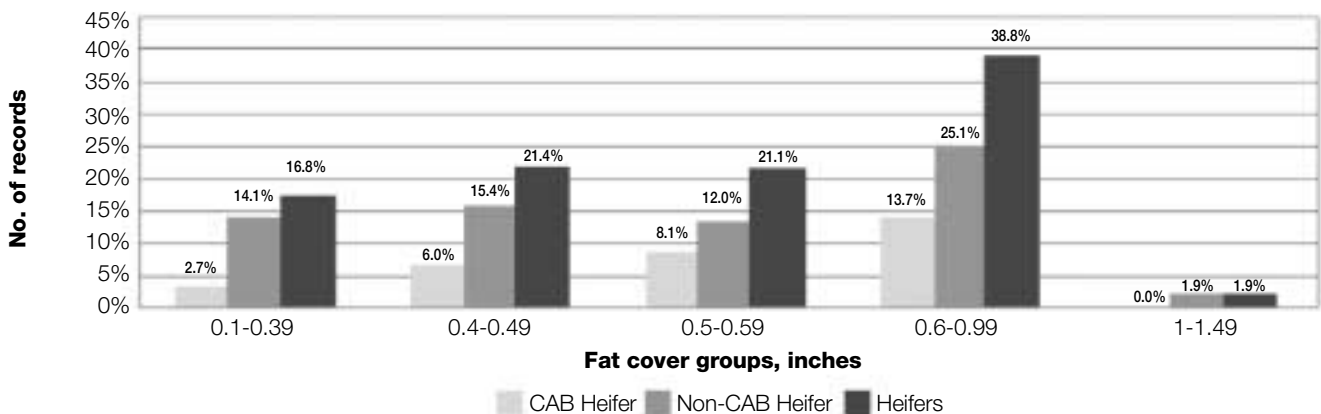

Fig. 2: Percent of record allocation, by heifer type, for fat cover

above from the total data set shows that only 29.8% of the cattle qualifying for CAB were YG 2.9 and lower, with 37.9% falling into YG 3-3.49. The remaining 32.3% were YG 3.5-3.99. Of those not qualifying for CAB acceptance, 43.4% were YG 2.9 or lower.

"We can improve yield grade and maintain quality," Wilson says. "Management is a part of that, but we've got to have the genetics there to allow it." Rouse says the Angus breed has made more progress in marbling than muscling during the last 10 years, but he agrees genetics are now available to make simultaneous progress.

"I think there is more potential for Angus-type cattle to make CAB today than 10 years ago, both in terms of genetics and what is known about management," Rouse says. "Ten years ago, we were seeing the effect of that period when we were really focused on trying to make cattle grow faster. In trying, they made them bigger and later-maturing — and they did that before they took a look at the marbling."

Chill time. Researchers have long indicated that there is an increase in marbling score when carcasses are chilled for 48 hours rather than 24 hours.

"That just didn't hold up in this study," Wilson says. There was no significant difference in marbling score and CAB acceptance rate comparing chill times of one day and two days.

Age. A portion of the data set (35%) included known birth dates, so age at slaughter could be calculated. Calf feds were classified as those 330-480 days of age at slaughter, while yearlings were classified as 481-660 days of age. The CAB acceptance rate for calf feds was 26.5% vs. 35.1% of those classified as yearlings.

Rouse says the higher CAB acceptance rates, relative to the database average, is due to these known-age cattle being part of the structured sire evaluation program. Moreover, he says producers should not read too much into the higher acceptance rate for yearlings.

"Structured sire evaluation progeny are predominantly fed as calves. That's the industry," Rouse explains. "The yearlings represent a small percentage of the population here and across the Midwest, where 90% of these database cattle were fed. Since marbling is typically a late-maturing tissue, you would expect cattle to marble more with age, all else being equal."

Wilson points out ultrasound technology can help identify cattle that have the genetic potential to achieve higher marbling levels as calf feds. But in general, Rouse concludes, "as Angus cattle get older, you will get a higher percentage of CAB because of the maturity. It will also reduce the level of YG 4s, because you make them a little bigger."

Gender. Though heifers represented a fairly small portion of the total data set (10%), they tended to have a higher marbling score than steers, a finding that is consistent with numerous other research studies.

Carcass weights. Of course there was a wide range in carcass weights throughout the study, but the correlation between marbling score and carcass weight for those cattle qualifying for CAB was 0.03 — revealing, for all practical purposes, a zero relationship between carcass weight and marbling score. In contrast, for those cattle that did not qualify, the correlation was 0.18. Therefore, as carcass weight increased, there was a slight increase in marbling score for cattle possessing lower levels of marbling (see Fig. 3).
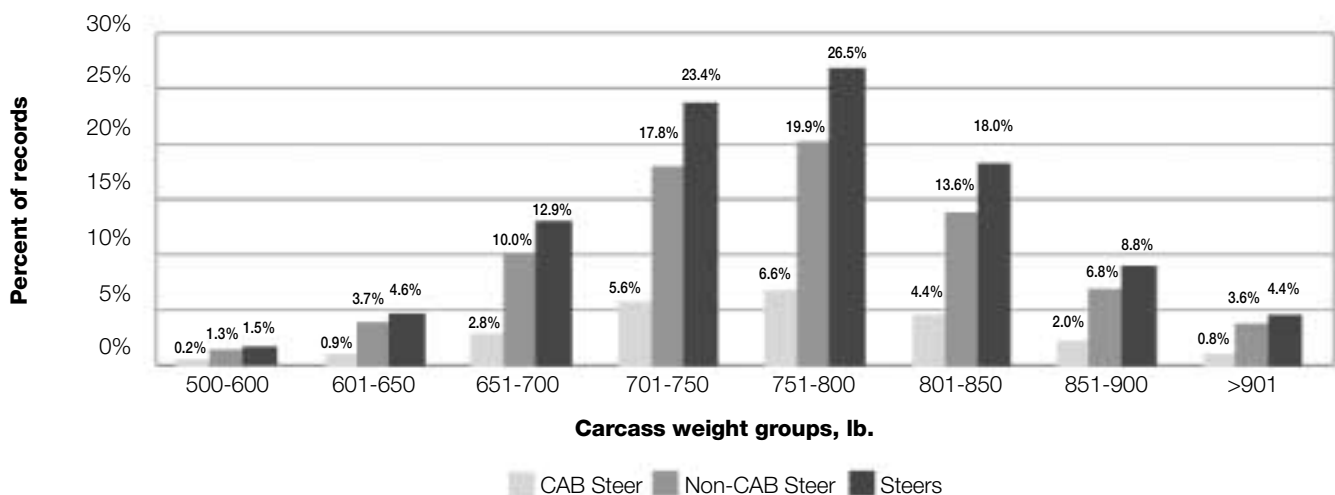
Ribeye area. Again, looking at the correlation within the data set, the relationship between ribeye area and marbling score was -0.01 for those qualifying for CAB. As ribeye area goes up, marbling score keeps pace among those cattle that ultimately qualify for CAB. However, in those not qualifying for CAB, the correlation was -0.15, implying a slight negative association between ribeye area and marbling score (see figs. 4 and 5 on page 108).

"A lot of animals — though we can't say exactly how many from these data — would actually meet CAB qualifications much sooner than when they are harvested," Wilson points out. "Ultrasound can be very effective, with feedlots going in earlier, selectively sorting out the cattle that have already met the CAB specs. Why carry them the extra days and put on excess fat? We can also identify those that will never meet CAB specs 45 days before they are harvested for appropriate management and market targeting."

Month of slaughter. Looking at strictly marbling scores, the lowest marbling score was in April, with the scores progressively

Fig. 3: Percent of record allocation, by cattle type, for carcass weight groups

Carcass weight groups, lb.	CAB Steer	Non-CAB Steer	Steers
500-600	0.2%	1.3%	1.5%
601-650	0.9%	3.7%	4.6%
651-700	2.8%	10.0%	12.9%
701-750	5.6%	17.8%	23.4%
751-800	6.6%	19.9%	26.5%
801-850	4.4%	13.6%	18.0%
851-900	2.0%	6.8%	8.8%
>901	0.8%	3.6%	4.4%

increasing to the highest score in November. It is also important to note that cattle slaughtered in April tended to be considerably younger, with an average age of 421 days at slaughter compared to 623 days for those cattle slaughtered in November.

Wilson explains these seasonal effects may be confounded with other factors, including age at slaughter, "based upon the cycles of production we have. It's hard to uncouple some of that effect."

Take-home message

As the ISU team moves forward with further economic analyses and genetic information cross-reference studies, Wilson says the take-home lesson from the first report must go beyond a need for more marbling.

"The CAB cattle have the genetic propensity to marble with minimal fat cover," Bolze concurs. "The challenge becomes locating the sires to produce these. I'm not sure that marbling EPD alone provides sufficient direction. Ultrasonography can help."

Wilson says, "If there's any trait the Angus breed needs to work on, it is improvement in percent retail product. The genetics exist to allow that without sacrificing progress made in muscling, marbling, reproduction efficiency or other areas because the correlation with those other traits is so weak.

"You can't take all the fat off the cattle; the cow has to have some to be reproductively fit. We have to identify the genetics to put that in the cattle at a younger age while still growing well, before they start 'plateauing' off on lean deposition, and all the excess energy goes to fat," he adds.

It will take management and genetics to improve percent retail product, Wilson says. "This is the challenge the industry faces. Unfortunately, when corn is extremely cheap, you may make more money just continuing to feed the cattle, regardless, so we have those market forces to deal with also. You can't hang your hat on that, though. That will change."

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Fig. 4: CAB® steers with marbling score, ribeye area and carcass weight averages by fat cover groups
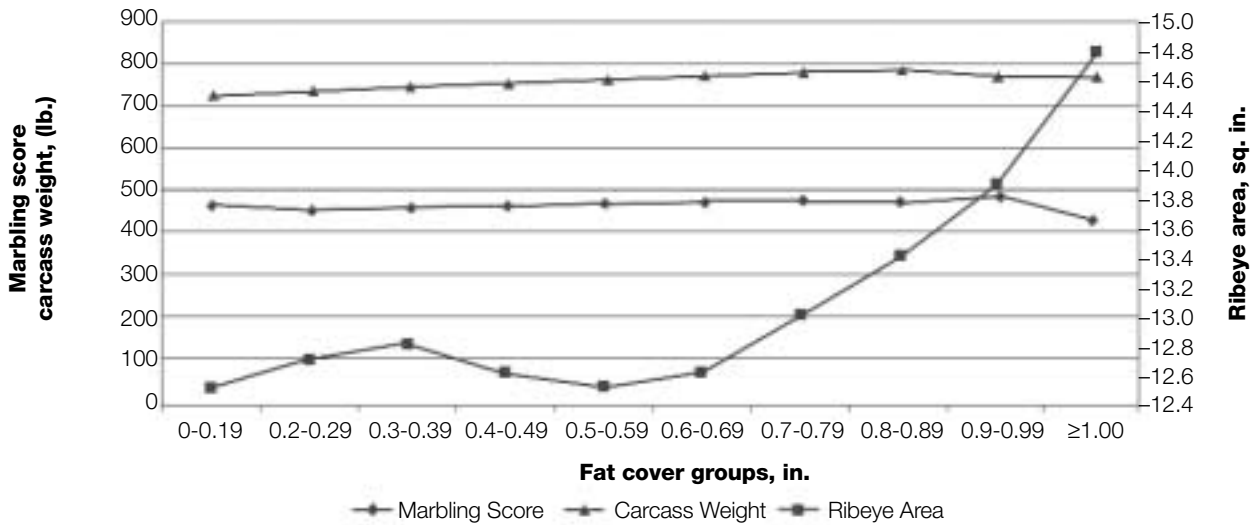

Fig. 5: Non-CAB® steers with marbling score, ribeye area and carcass weight averages by fat cover groups