



Carcass Merit in the Real World

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While most primary beef producers still market their product as live cattle, rather than as beef the connection between beef demand and live cattle prices is inherently obvious. More cattle are now being source verified, direct marketed or owned through the feeding process. This is evidenced by the tremendous changes in the auction market scene over the last 20 years with growth in direct, internet and satellite sales, and the rapid expansion of custom feeding operations in step with an increasing feeder cattle population. As well, we have seen an increase in carcasses sold through grid pricing and other market specific programs. These include programs that range from highly marbled grain-fed product for the white cloth restaurant trade, through to grass finished, hormone free and extremely lean product lines. These markets all reward different aspects of carcass merit but all serve to emphasize the vast difference in value between individual carcasses. In many cases these value differences are in excess of \$150 per animal.

Reproduction, Production and Product

Research conducted in the late seventies based on the sale of weaned calves showed that the most profitable emphasis on reproduction, growth and carcass was in a ratio of roughly 10:2:1. In other words, reproduction was 5 times more important than growth, and 10 times more important than carcass characteristics to overall profitability. More recently research has shown that this ratio is changing. Some work conducted by various alliances show that the profit ratio is closer to 4:2:1 and work done on industry integrated firms (where the breeding herd and the processor are one organization) shows that the most profitable scenario may actually put the most focus on carcass characteristics than on either reproduction or growth.

Genetics control the upper potential of end product merit. Stated another way, we can't feed or manage an animal to a potential or carcass type that it does not have genetic predisposition to achieve. There are a variety of good examples of this fact, but the best is the cooler at a packing plant. In progeny test programs we see carcasses that range all the way from 1 inch of backfat and beyond with no marbling, to 7 inch of backfat and prime marbling to cattle that are completely devoid of fat and marbling after extended feeding periods on high energy rations.

One of the best things about these carcass or end product characteristics is that they are relatively responsive to selection. Heritability of most carcass traits is classified as moderate, meaning that genetics account for a relatively large portion of the observed variation, and that we can make changes fairly rapidly. Also important is that most of the correlations between fat and lean are in the moderate range, meaning that we can identify potential parents that can take us in specific directions, such as increasing lean yield and marbling at the same time.

So where does an average commercial producer or their bull supplier place their emphasis and their limited funds?

Most producers are not going to radically change the way they market cattle in the near future. This means that for most, emphasis on carcass characteristics probably falls close to the 10:2:1 rule. This does not mean that end product merit is not important it just means that reproduction and growth should receive more emphasis than carcass merit. It is also important that producers plan for how they may market cattle in the future. Producers planning to direct market cattle to feedlots can benefit from improving carcass characteristics. Cattle with known histories of performance do generate on farm premiums. Producers who are planning to feed their own cattle through to the rail in the future can obviously realize larger benefits from carcass characteristics and should focus even more emphasis on carcass merit.

Knowing where your cattle fit, and/or what market they are headed into now and in the future can greatly affect your focus and profitability as well. In a typical mainstream market we are trying to bend the curve of lean yield and marbling. That is, improve both lean yield and marbling. In other markets, such as some of the lean products, we are trying to benefit from reduced marbling and increased lean yield while controlling carcass size.

A suggestion for producers who may be looking to retain ownership longer into the chain is to put some focus on identifying the carcass genetics going into your replacement females. Longer term, this gives a general working base to develop markets further into the production chain. Think of it as a risk reduction strategy by identifying the markets that best fit your cowherd by controlling incoming genetics.

Producers who are looking to make rapid changes in the way they market cattle are advised to put heavy emphasis on the carcass merit of their terminal sires or bulls that are siring their feeder cattle, and also to begin to place some emphasis on carcass traits for sires that are producing replacement females.



Another very worthwhile tool for commercial producers is crossbreeding. For example, in many markets matching breeds or cattle that marble heavily with breeds or genetics that excel in lean yield is a great way to benefit from hybrid vigour, maintain an easy keeping cowherd and still benefit from an outstanding balance of carcass traits.

How do I select for carcass traits?

It is impossible to select for carcass characteristics through simple visual appraisal. A great place for seedstock providers to start is with the proven technology of ultrasound. Most people are familiar with ultrasound in the medical profession where it is used for a variety of things such as assessing the health of unborn babies. Research has shown that ultrasound of yearling seedstock is highly associated with the performance of their slaughter progeny. It is also cost effective, non-invasive and allows for rapid collection of information on large numbers of cattle. Somewhat more involved is an organized progeny test, or collection of harvest records on non-sale animals. Several breeders and/or breed associations are already collecting and working with this type of data as well. Commercial producers interested in carcass merit should be looking for bulls with the tell tale clipper marks shown in Figure 1 that identify a yearling bull as having been ultrasound scanned according to most breed association guidelines.

Carcass EPD are the best way to change carcass characteristics. Notice the word change, rather than improve. Knowing your target market for your cattle and using available EPD is the best way to improve carcass characteristics. Direction is essential to improvement. For a sample of breed average carcass EPD see table 1.

Some breeds may not have carcass EPD available, and in this case the next best option is to work with your seedstock supplier to evaluate ultrasound information within their herd to identify individuals or sire genetics that are leading in the direction you wish to go. In this situation they will ideally they will have age adjusted ultrasound values available.

Keeping a record of incoming genetics and resulting carcasses will assist over time in determining the optimal level of carcass traits within an operation and marketing program.

Table 1. Sample of spring 2006 breed average carcass EPD

	Carcass Weight	Rib-Eye Area	Backfat	Marbling	Yield
Angus		0.04	0.00	-0.03	
Red Angus		0.00	0.00	0.01	
Charolais	8.6	0.08	0.31	0.01	-0.21
Hereford		0.09	0.00	0.00	
Limousin	16.1	0.12	0.00	0.00	0.04*
Simmental	-1.7	0.05	0.00	0.06	-0.05*

* Limousin and Simmental express yield as yield grade. Thus a lower value indicates more yield grade 1s, or higher lean yield. Charolais expresses yield as % lean, thus a higher value indicates more lean yield.

Important Note: Carcass EPD cannot be compared directly across breeds, as each breed conducts its own independent evaluation. For more information on carcass evaluation please contact your seedstock supplier or related breed association.

Planning, Reflection and Balance

The key to success in incorporating carcass characteristics into a breeding program can be summed up in three words: planning, reflection and balance. Technologies such as ultrasound, and carcass EPD are cost effective and are proven to work in changing carcass characteristics.

Producers need to plan their goals and target markets to assist in setting direction for their program. This ensures progress rather than change. When marketing cattle they need to reflect on the results and review the genetics that got them there in order to maintain or change their genetics as needed, and they need to keep carcass characteristics in perspective with their operation. Genetic selection in beef cattle is not a rapid fire process, so positive change takes time and careful planning. Chasing carcass merit at the expense of reproduction and growth can be dangerous, but the benefits of a well planned and balanced carcass improvement program can be extremely rewarding.