Genetic Trends and Selection Pressure

By Jerry Lipsey, Ph.D.

Don't turn the page until you read this, it's more important than you think.

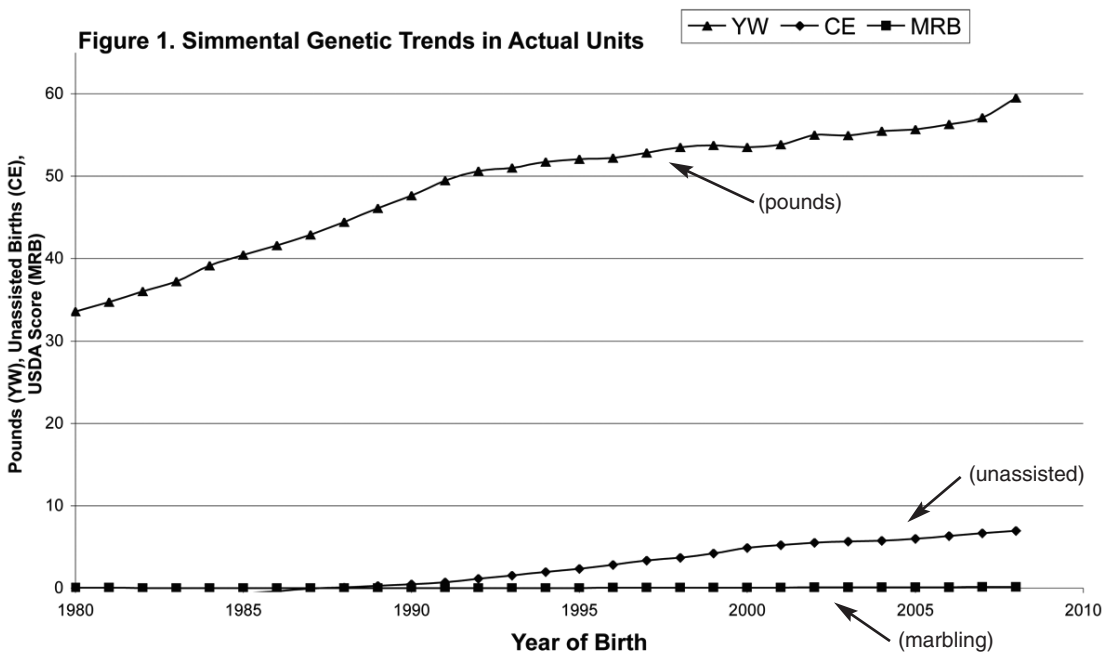
If you make a living in the cattle or beef industry, you should be monitoring the genetic changes (by breed) that have occurred and probably will continue. The three benefits you can get by understanding genetic trends and selection pressure are:

A. Proof that the genetic source (the Simmental breed, for example) is changing (increasing or decreasing) traits of importance;

B. An indication of the percentile rank you need to get the level of performance your enterprise needs for management success and potential profit;

C. The logic to combine A and B so the resulting production targets a fed steer goal of 70% Choice and 70% YG 1s and 2s.

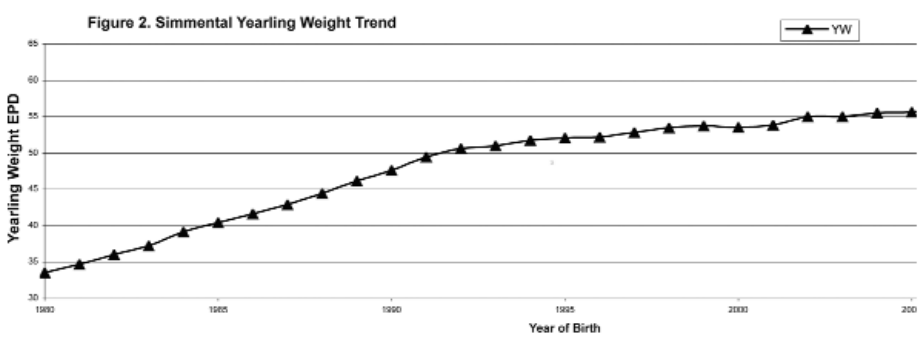
First, we need to discuss how genetic trends can be displayed. Figure 1 displays genetic trends for Simmental yearling weight (YW), calving ease (CE) and marbling (MRB).



Yearling weight looks much more impressive than either calving ease or marbling in Figure 1, and it appears we have made more progress in yearling weight. However, this graph is not properly designed to compare selection progress; it only shows the direction the traits are moving. For example, the Y-axis units that measure yearling weight, calving ease, and marbling are pounds, percentage born unassisted, and USDA score respectively. Because we can't directly compare pounds, percentage born unassisted and USDA marbling scores, we really can't determine from this graph the relative improvement of traits. We can only see the direction the traits are moving. Even if traits are measured in the same units (e.g., birth and yearling weight) there can be so much difference in their magnitude and range that comparing them on the same graph is hardly informative.

Think of it this way; it's sure easier to improve yearling weight 1 unit (a pound) than decrease birth weight 1 unit (a pound). It is fair to ask, which is easier, increasing yearling weight one unit (one pound) or increasing marbling one USDA Score?

In addition, graphs can be visually deceiving due to the lengths of the X and Y-axis. Figure 2 and 3 show the same data; however, we have reduced length of the X-axis in Figure 3 to give the impression that progress has been better.



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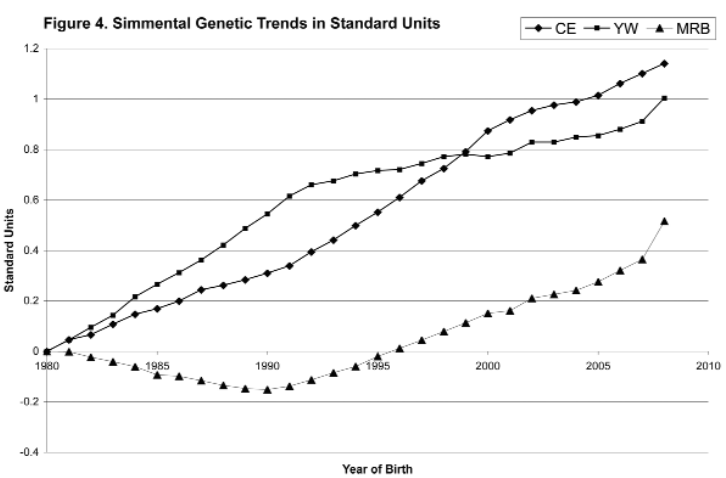
So, genetic trends displayed in actual units (pounds for example) are only "mild proof" that traits are changing. The American Simmental Association recognized that there is a much more effective means of gauging selection pressure; that is by converting actual trait units (pounds, percentage born unassisted, UDSA marbling scores, etc.) to a standard measure.

Let's go back to our comment on the ease or difficulty of changing yearling weight or birth weight one pound. The equitable method to compare progress is to compare "trait movements" on a standard deviation basis. Now, don't freeze up when we say standard deviation. It's the statistical way (fairest way) to compare traits.

Figure 4 displays Yearling Weight, Calving Ease and Marbling genetic progress on a Selection Pressure basis. In recent years, calving ease has increased more than yearling weight, and marbling has made distinct improvement. These data in Figure 4 are the most realistic and accurate in evaluating Simmental breeders' efforts and progress.



By understanding these figures, we can use some common sense to fine-tune bull selection. Let's say you really like the steer calf growth performance and usefulness of Simmental crossbred females, but you are concerned about breeding Simmental bulls to yearling heifers sired by Angus or Red Angus bulls.

Both Simmental CE Genetic Trends and Selection Pressure confirm calving ease is improved over years; but, is CE improved enough to use a Simmental bull on virgin British-sired heifers? Undoubtedly, an average CE EPD bull from 2007 provides more calving ease security than an average bull from 10 or 20 years ago. However, careful selection of a Simmental sire with a distinctly superior CE EPD (13 or better is in the top 1% of all Simmental) should be a priority for this situation. On the other hand, average Simmental EPDs for growth (weaning, yearling and milk), and maternal calving ease and maternal weaning weight should be sufficient for this production circumstance. What if we added a steer carcass target of 70% Choice and 70% YG 1s and 2s to this bull selection project?

We can't make perfect rules for every cowherd, management circumstance and environment, but the American Simmental Association has spent more time and effort than any seedstock source to investigate production of 70:70 carcasses. In the recent issue (Early Fall 2008, page 10) of *SimTalk*, Marty Ropp discussed EPD profiles of Simmental bulls that successfully sired 70:70 feedyard steers. He noted that 1,327 Simmental X Angus steers finished by the University of Illinois have averaged 74% Choice and 60% YG 1s and 2s.

However, Marty clearly points out that average Simmental bulls did not sire these steers! These were some of the elite proven and young sires tested each year in our carcass merit program. To sire 70% Choice steers, these bulls' marbling EPDs averaged 0.35, which puts these sires in the top 10% of all bulls in the ASA database. The dams were commercial black cows, and required better than Simmental average YG EPD achieve nearly 70% YG 1s and 2s.

Sire selection has not been easy. If it were, all cowherds and fed cattle would be nearly perfect! In this example, we identified extreme calving ease, average growth, exceptional marbling and slightly above average yield grade EPDs as targets for sire selection. Although we know unique sire selection exists, the ASA All Purpose Index (API) does a remarkable job at identifying sires with potential to advance most cowherd profits.

Choosing sires with top API percentiles often assures economically balanced trait selection (API even takes maternal calving ease, longevity and cow maintenance into account). In our above example, identification of a sire with exceptional API and CE EPD would hit the targets we outlined. SimGenetic sire selection is getting easier because our economic indexes are a giant step toward wise sire selection.

For all Simmental and Simbrah Genetic Trends and Selection Pressures go to www.simmental.org, then Genetics.

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