

What is the new Maternal Weaned Calf Value (\$M)?

\$M, expressed in dollars per head, aims to predict profitability differences in progeny due to genetics from conception to weaning. \$M is built off of a self-replacing herd model where commercial cattlemen replace 25% of their breeding females in the first generation and 20% in subsequent generations. Remaining cull females and all male progeny are sold as feeder calves. The index finds cattle that are most profitable when the producers receive no economic benefit for traits affecting post-weaning performance.

What are the differences between \$M and \$W?

Even though similarities in the shared breeding objectives of both \$M and \$W are seen, several differences between the two \$Values readily appear. In fact, the correlation between new \$M and what is known as \$W is only 0.4, which means the two indexes rank animals differently when lined up side-by-side. The following two features induce the largest changes in \$M:

Inclusion of more traits. The \$M model includes additional traits to better define profitability from conception to weaning. While \$W comprises only four traits: BW, WW, Milk and MW, \$M takes advantage of nine different EPDs. The traits included in \$M are calving ease direct (CED) and maternal (CEM), WW, Milk, heifer pregnancy (HP), docility (DOC), MW and foot score EPDs - both foot angle (Angle) and claw set (Claw).

Use of non-linear components. \$M model takes advantage of fitting traits, including Milk and calving ease, as non-linear components. For example, when the index considers Milk, the benefit of having more Milk starts to diminish once the optimum is met. **Figure 1** illustrates that an increase in Milk from a +10 to a +20 increases the value of \$M significantly. However, increasing from a +20 to a +30 Milk does not increase \$M by the same magnitude. Notice in **Figure 1** how the curved line starts to level out as Milk continues to rise.

Why is BW not included in \$M?

CED and CEM are used in \$M, as calving ease is the economically relevant trait when considering dystocia. Additionally, all birth weight records are utilized in the prediction of calving ease EPDs, making its direct inclusion unnecessary.

Will high Milk bulls be automatically discounted with the use of non-linear components?

High Milk cattle are not automatically discounted. Rather, cattle are not able to rise to the top of \$M solely based on high Milk alone.

How are the newer traits with fewer records accounted for?

When fewer observations are available on a trait, the EPDs spread less, reducing the impact of the trait on the index. The limited number of records are accounted for in the EPD calculations, and as more information becomes available, the EPD range increases and the impact of that trait on the index also increases.

If a producer chooses to solely select on \$M, what types of genetic change can be expected?

A useful tool when trying to understand how \$M places different emphasis on traits is to analyze their expected response to selection while accounting for the intercorrelations between all the traits. Figure 2 illustrates the expected response in the EPD traits up to approximately 10 years of selection. Response to selection is a useful tool as it takes into account the intercorrelations between all the traits. \$M places greater emphasis on the cost side of commercial cow-calf production than any tool available in the past, decreasing overall mature cow size by 16 pounds and maintaining weaning weights consistent with today's production. Under \$M selection, less emphasis is placed on Milk, while HP and DOC have an increased emphasis. In addition, foot traits start to improve.

Maternal Weaned Calf Value (\$M) FAQ

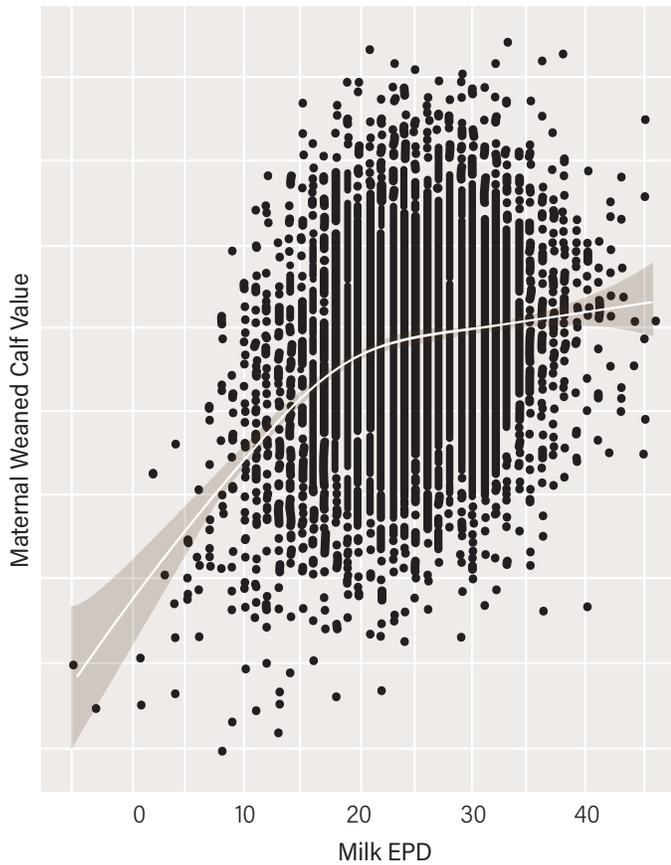


Figure 1. Non-linear component of Milk expressed among ~6,600 females across the population. Milk is on the horizontal axis and \$M is on the vertical axis.

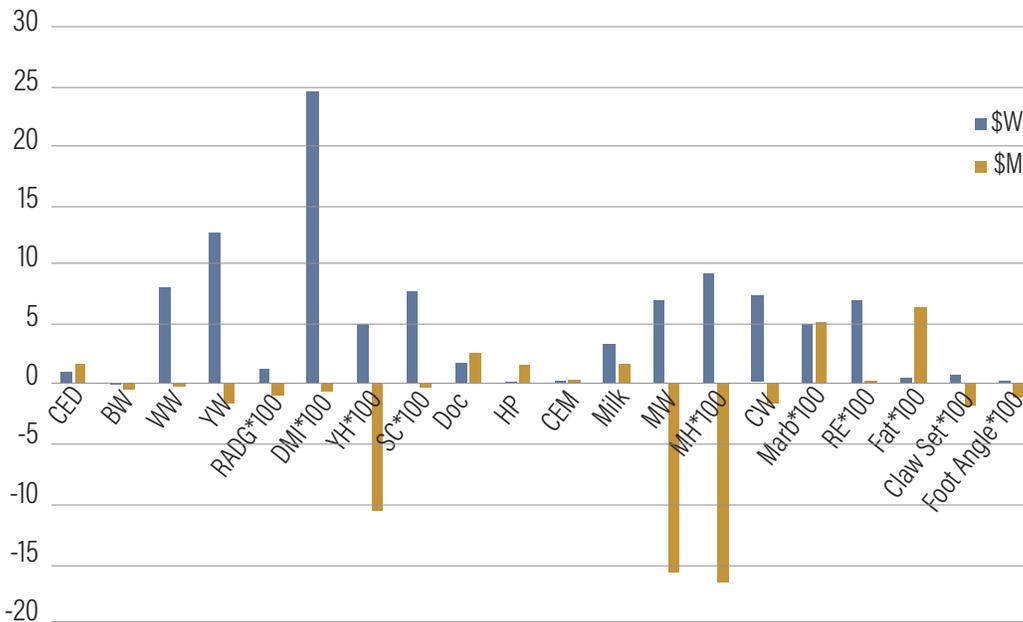


Figure 2 illustrates the expected response in the EPD traits up to approximately 10 years of selection, if animals were selected strictly on \$M versus \$W. It is important to note only the nine previously listed traits are used directly in the formulation of \$M. However, some traits (i.e. carcass weight) show a small response to selection of \$M because of the correlations present among these traits.