The optimum mature cow size for profitability and efficiency is a widely debated topic. Cow size is often used to measure biological efficiency and profitability, but factors beyond cow size also contribute to these measures. Biological efficiency has been defined in a number of ways. All measuring efficiency differently the methods include; pounds of calf weaned per cow exposed, pounds of calf weaned per unit of cow weight, and pounds of calf weaned per cow exposed per unit of energy consumed (Greiner, 2009). The efficiency is dependent on many factors including requirements for cow maintenance, gestation, lactation, and reproductive performance. However, the cow cannot be responsible for all of the biological efficiency. The growth requirements and maintenance requirements, and ultimately the calf weight will significantly impact the measure of efficiency.

It is important to note that biological efficiency does not always directly translate into economic efficiency. For example, a smaller cow which is biologically efficient may produce more pounds of calf at weaning on fewer feed inputs compared to another female, but the calf that she produces may be smaller and less valuable than a larger female can produce. If feed costs are high, the larger female could potentially be more economically efficient. On the opposite side a larger cow may produce a heavier calf, but in comparison it may take more feed resources to produce those extra pounds of weaning weight. These complexities further encourage producers to find the optimum cow size that results in the biological and economical efficiency that best fits their resources. For most, the ideal scenario would include modest sized cows with high reproductive rates that require low input costs and produce high value calves.

Animal maintenance is defined as the energy requirement per unit of body weight. Generally a high-maintenance cow is characterized by high milk potential, high organ weight and low fat mass. Low maintenance cows on the other hand have low milk potential, low organ weight, and high fat mass (Greiner, 2009). Furthermore, mature cow size impacts intake, energy and protein requirements. To illustrate how much requirements increase with size, as mature cow size increases from 1000 to 1400 pounds, there is a 23%, 19% and 13% increase in intake, energy and protein requirements respectively (Short & Adams, 1988). This should come as no surprise since larger cows require more feed resources to maintain their large size, and high milkers have higher requirements for energy and protein.

The availability of genetic tools such as EPDs have contributed to mature size through correlations. For producers that sell at weaning, the weaning weight EPD is obviously a very important trait to select upon when selecting parent animals to improve animal performance. However, larger cows tend to have heavier calves at weaning resulting in an unintended selection for larger mature cow size if heifers are being retained. Another contributing EPD would be the MILK EPD that is interpreted in the number of pounds at weaning as a result of the mother’s milking ability. As previously mentioned, cows with higher maintenance requirements generally are heavier milkers and contribute more pounds of calf at weaning. Those producers selecting for heavier weaning weights and higher milkers when retaining heifers may be making unwanted changes to their operation. This selection pressure would explain the increase in mature cow size that many producers have observed over years. While larger mature cows likely means heavier weaning weights, it does not consider the increases in nutrient requirements for those females or their efficiency.

It is believed that selection based on EPDs of interest and genetic correlations between traits is what has increased cow size so significantly. While selection pressures have placed us in this conundrum, they may also be what gets us out. Multiple trait selection will allow for the producer to place pressure on multiple traits that they find important. This could include traits that relate to calf growth and reproduction, as well as those that relate to mature cow size and milking ability. Taking a wider view of traits of interest will slowly over time result in improvements to the cow herd. Once cow size is optimized, careful planning can keep mature size in check and still result in valuable calves. For example, an Angus operation may place great emphasis on managing moderate sized females and then breeding them to sires that have superior genetics for calf growth and moderate mature daughter weight EPDs.

While mature size can help us make predictions about input costs, we care more about animal efficiency. Cow efficiency, however, is a multi-trait measure that varies with the production environment and management style. Hence this supports that an efficient cow for one operation will not necessarily be efficient for another. Selection decisions should be made in moderation. If mature cow size is increasing, a selection towards more moderate weaning weight and milking ability can correct this problem over time. However, the most important thing for mature cow size improvement is to keep good records to determine cow size and productivity. Remember you can’t manage what you don’t measure! Once record keeping is perfected, one can make more informed decisions to transform the cow herd into one that fits the available resources and still produces valuable calves.

For more information on mature cow size, please visit or call the Cheyenne County Extension Office at (785)332-3171.

For more resources and event announcements, please follow us on Facebook at K-State Research and Extension Sunflower District.