

Farm Update:

Record rainfall during the winter and spring has been followed by record heat and drought conditions. Temperatures topped out at 108 degrees this summer and rainfall has only been .2" since June 7th. Needless to say there is no pasture and I have had to start feeding hay in the last 3 weeks. Surprisingly all the cows have maintained excellent condition. Based on ultrasound our 2018 calf crop will be 75-80% heifers. Third year in a row where our calf crop has been at least 65% heifers. Not sure about why but obviously the bulls continue to have a big impact on the bull/heifer ratio.

Bi-Monthly Topic: Calves and their Environment

No this is not going to be a "green" environmental discussion. Instead I will examine calf development and how early environmental factors can have lifelong implications both in feed efficiency and adaptability. It has been known for a long period of time that diet and environmental factors play a major role in a calf's development. What is revolutionary and surprising, is how environmental conditions during the uterine development of the calf can preset the calf for success or failure as a productive cow. Calf development can be separated into three stages: in utero, nursing stage, and growth to breeding.

In Utero development can be affected by several factors relating to both genetics and maternal capabilities of the calf's dam. Epigenetics is the study of how particular genes are influenced by environmental factors, especially in utero, and has been found to play a major role in gene expression. Simply put, the genes a calf possesses may be turned on or off by the conditions/feeding of its dam. This is particularly important in the first three months in the uterus. Therefore, to maximize positive traits in the developing calf adequate nutrition and minimum stress should be emphasized for the dam. There is a tremendous amount of research being done to further the understanding of epigenetic effects to produce the best calf possible. For now, the old adage about only emphasizing cow nutrition in the last trimester should be replaced by balanced nutrition for the dam from day one of her pregnancy. Anything less undoubtedly has a negative impact on obtaining the maximum genetic benefit for the calf.

Epigenetics also plays a role in ET and cloned calves. The recipient uterine environment will be different from the donor cow's. Therefore, the recipient cow will turn on or turn off some genes in the developing calves resulting in "a different calf". This partially accounts for why cloned

calves are not actually “identical”. There is no way that ET or clone calves truly reflect the exact genetic makeup that they would have had if they were carried by their own dam. This contributes to the variabilities and inaccuracies seen in EPDs.

The nursing stage brings many additional factors regarding calf development into play beyond the milk production of the calf’s dam. Certain cows end up being “nurse cows” in the sense they allow other calves to nurse besides their own. This distorts the growth parameters of their own calf and that of any “robber” calves. How can EPDs for growth be compared during the nursing stage when this is taken into account?

At approximately 84 days of age a calf is receiving 50% of its nutrition through its dam’s milk and 50% through whatever else it consumes: grass, hay, and grain. The dam is in essence teaching the calf what to eat. It is important to note that during this stage of development the calf’s rumen is taking shape with the introduction of specific bacteria and protozoa that play a role in digesting whatever else the calf ingests besides milk. So if the diet is grass/hay based, the calf will not only learn what to eat, but will develop its rumen bacteria and protozoa to fit its food intake to maximize digestion. If creep feed is available then a different type of digestive bacteria and protozoa will dominate. This has life long implications for the calf. A calf that grows up consuming creep has reduced ability to do well in a purely grass fed environment. Too often both breeders and buyers forget that calves raised in a grass/hay system are much more adaptable, diet wise, than a calf that grows up with a “bucket of corn” in front of it. Rumen capacity may also be larger in a calf raised in grass/hay environment because of the mass of grass/hay the calf may be consuming to meet its nutritional needs. Show calves often do not do well as cows because they have been developed in unnatural conditions. As a result of dietary stress, they may have had their digestive system permanently altered and are never able to adjust to a real world environment. I can’t emphasize enough that buyers should always take into account a calf’s dietary history in deciding whether the calf can be a good herd addition. Such things as exposure to Kentucky 31 (endophyte infected tall fescue) and other toxic plants, such as tansy, can also ultimately play a role.

Two areas of additional concern should be the purchase of show cattle and yearling bulls that have been pushed through high grain diets. Excessive fattening at an early stage of life can put stress on bones and internal organs. Possible hormone treatments or chemical “enhancements” can further disrupt calf development. Even the use of climate controlled environments like chill rooms can cause problems. Using any of these techniques produces an “artificial” growth environment, and can lead to later problems. This partly explains why so many show calves never live up to their buyer’s expectations. Purchasing this type of heifer or

bull will most likely be a disappointment for the buyer when that animal is placed in a normal working herd environment.

Once weaning occurs the rumen becomes the focus of, in a sense, the calf's development into a cow. How that rumen "has been built" will help the calf adjust to being on its own and allow it to grow into a fully developed heifer and ultimately a great cow. No amount of farm acclimation can totally make up for improper calf management whether at the embryo, nursing, or growth stage. To ignore the subtlety and nuances of calf development is a sure way to shorten the productive life of any cow and in the process to reduce the profits we are all searching for—especially in today's tough cattle market.

Joseph A. Schallberger, DVM, PhD
Whispering Hills Farm
Member Academy of Veterinary Consultants