# Nutrition vs. Embryonic Death Loss

**Post-breeding nutritional management affects heifer pregnancy rates.**

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The yearling heifer represents the best genetics and serves as the future of the cowherd. Heifers need to reach puberty and start cycling prior to the breeding season for best results, and it is well documented that heifers need to reach a target body weight to attain puberty prior to the breeding season. Assuming that a heifer has reached puberty, recent research has suggested that a larger percentage of heifers conceive to their first service (AI or bull bred) than originally thought. However, sometime between conception, when the heifer's body recognizes that she's pregnant (~14 days post-breeding), or when the fetus attaches to the uterus (~30 days post-breeding), the pregnancy is sometimes terminated.

There are numerous managerial factors that could lead to a heifer not maintaining a pregnancy. Frequently the most overlooked aspect, and the one this article is focusing on, is nutrition. Beef producers spend a lot of time, effort and money getting heifers to the proper weight and body condition prior to breeding. The same can be said for either artificially inseminating (AI) heifers or researching and buying heifer bulls. However, it often appears that once AI is completed or the bulls are turned in, that nutritional management is over and the heifers are simply turned out onto pasture. There is a common belief that spring grass is about the best feed available. This is partially true. No doubt that spring grass can be high quality, but it can also be high in water content and washy. Often times, heifers will spend a tremendous amount of energy chasing grass. But the real question is what plane of nutrition were these heifers fed until breeding? Heifers that are fed a high-energy (corn silage, corn, etc.) diet in a dry lot until breeding and then turned out onto pasture after breeding suffer a dramatic decline in dietary energy density, even in quality pastures. It may take a couple weeks for these heifers to adapt to their new diet. The change in nutritional status may be subtle, with very little drop in condition score, but this decrease in plane of nutrition coincides with maternal recognition of pregnancy and may result in embryonic loss.

Recently, we analyzed heifer data provided by Dr. George Perry, South Dakota State University, from multiple breeding herds. This data suggested that if heifers were losing weight after breeding, usually from a change in provided dietary energy (such as going from a feedlot to a pasture), conception rates were reduced. More recently, we tried to answer some of these questions with a nutritional research study at the University of Wyoming in conjunction with Purdue University. For this study, heifers were fed a ration designed to gain about 1.5 lbs/day throughout the winter until breeding. Immediately following breeding, one group of heifers were maintained on the same diet for 20 days, another group of heifers were fed a diet designed to maintain (neither gain or lose) body weight for 20 days (which is a decrease in nutritional status from their pre-breeding ration), and the last group was fed 80% of their maintenance requirements for 20 days. After 20 days, all heifers were fed a similar diet. The results were striking and magnitude of change in conception rates between locations was almost identical.

A pregnancy check utilizing ultrasound technology at 35 days post-breeding revealed an almost 20% decrease in pregnancy rate for the groups of heifers that had a reduction in nutritional energy post-breeding. It is important to note that this is not a huge decrease in dietary energy and the heifers in the maintenance group did not lose weight; they were fed to maintain their current weight. In fact, at the end of the 20-day period, there was no detectable difference in body condition score. However, it appears that the change in nutritional plane was enough to affect the myriad of physiological processes occurring during that period of time. The data also suggested that there was no difference in conception rates between the two diets that decreased dietary energy. It seems that the level of change in energy was not as important as the change itself. This study was designed to mimic the effects that a heifer could potentially go through when they are fed high-energy diet pre-breeding and then turned out onto pasture immediately post-breeding. The best-case scenario would be to keep those heifers on the same plane of nutrition for the month following breeding.

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There are varying philosophies regarding how heifers should be developed. One approach is to feed them high-energy feedstuffs to maximize the number of heifers that attain puberty and conceive, while the contrasting approach is to rough them through on a low-energy diet and select from the heifers that develop and conceive.

Regardless of how these heifers were developed they represent a significant investment of both time and money, and represent the future of the cowherd. If we have invested the time and money to retain and develop her, regardless of system, doesn't it make sense to give her every opportunity to not only breed, but to also maintain that pregnancy? By reducing her stress, both nutritional and physiological, during the key metabolic periods discussed above, we can help maximize the number of pregnancies maintained. **ST**