

# BEEF SOLUTIONS

## SMART PRODUCERS, SMART SOLUTIONS



E-Newsletter

April 2017

### Managing nutrition and estrus synchronization of yearling heifers

*Tyler Melroe, M.S., Beef Nutritionist, Hubbard Feeds*

Developing and breeding yearling heifers can be equally rewarding and frustrating. The process is too timely and costly to land anywhere short of success. The technology around estrus synchronization continues to evolve and improve. However, the best protocols alone are not enough to create high pregnancy rates. It requires meticulous planning to properly execute the synchronization protocol and nutrition programs. It all matters when fighting for a few percentage points.

#### Setting Up Success

When it comes to managing heifers, perhaps nothing is more critical than managing their nutrition. The traditional recommendation was to target 65% of their mature weight at breeding. However, recent research has focused on challenging the lower limits of this number. Producers in situations with limited feed resources and low input genetics can achieve satisfactory pregnancy rates by targeting approximately 55% of mature weight, if they are on a positive plane of nutrition. This limits the resources required to develop heifers and can limit mature size. However, if maximizing pregnancy rates is the goal, 65% of mature weight should be the target minimum.

Practically speaking a 550-pound heifer weaned in October, targeted for breeding in May would require around a 1.75 pound average daily gain if we expect her mature weight to be 1400 pounds. It is important that you work with a nutritionist that can help you achieve this goal. One key to success will be having the vast majority of heifers achieving puberty well in advance of initiating the synchronization program. Remember to be conscientious of the lightest and youngest heifers in the pen, not just the average.

Nutrition can often be a balancing act and involves more than just hitting the minimums. The move toward breeding heifers at a lower percent of mature weight highlights that fact that over-feeding replacement heifers can have negative consequences. The most obvious consequence is the increased cost. Additionally, developing heifers with excessive condition may limit their longevity.

While the feeding program may be targeting a lower average daily gain than some are used to, a common practice is to slightly increase the energy prior to initiating the synchronization and breeding program. This flushing technique ensures the heifers will be in a positive energy balance at breeding and signals her system that adequate energy is available to conceive and maintain the pregnancy.

Energy and protein are not the only important nutrients to support conception as trace mineral quality and quantity also play a critical role. Copper, manganese, and zinc are involved in several enzyme functions that can in turn impact fertility in both females and males. Another trace mineral of interest is selenium, where deficiencies have been linked to increased embryonic loss and higher rates of retained placentas. Of note, some rangelands in the United States are naturally high in selenium and toxicity can be an issue. Be sure to understand your environment and need, or lack thereof, for selenium.

Because of the importance of trace minerals, producers and researchers have looked at utilizing trace minerals that are more bioavailable and less reactive. These minerals are often referred to as organic trace minerals or chelates. Utilizing them, at the appropriate level, has been shown to have a positive influence on pregnancy rates to AI (artificial insemination).

*(continued on next page)*



Hubbard Feeds  
Mankato, MN  
1.800.869.7219  
[www.hubbardfeeds.com](http://www.hubbardfeeds.com)

## Concept of Estrus Synchronization

Synchronizing estrus utilizes three separate hormones, each with a specific function. The basis of synchronization programs is utilizing prostaglandins to initiate estrus. Progestins (progesterone), like MGA or CIDRs, allows for more heifers to respond to prostaglandin. Most recently, GnRH (gonadotropin releasing hormone) has been used to help synchronize ovulation.

Utilization of progestins and GnRH have played a big role in the use and ultimate success of timed AI programs. It is critically important that the protocols be followed with precision, as deviations in timing can have a negative impact. To keep up to date on the latest synchronization protocols for all cattle visit: <http://beefrepro.unl.edu/resources.html>

## Post Breeding Management

It is important to remember that these programs start well in advance of AI and, as recent research would indicate, continues well after. Both post AI transportation and nutrition have been shown to have an impact on the success of the program.

First, plans should be made to transport heifers either as quickly as possible after AI or maintained at the same location until approximately 6 weeks after AI. Table 1 demonstrates the effect of moving them at different times after AI. Physiologically, several events are occurring. Within the first week the embryo is already developing, maternal recognition of pregnancy occurs around 2 weeks post-AI, and definitive attachment of the embryo to the uterus does not occur until around 6 weeks post-AI. It is that intermediate period where the greatest risk of embryonic loss exists.

**Table 1. Effect of time of transport after insemination on pregnancy rates**

Days after insemination that transport occurred	1 to 4	8 to 12	29 to 22	45 to 60*
Synchronized pregnancy rate	74%	62%	65%	----
% pregnancy loss compared to early transport	----	12%	9%	6%*

\* Loss compared to percent pregnant prior to transport

Data adapted from Harrington et al. 1995 and Merrill et al. 2007

As impactful as transportation can be, dramatic changes in nutrition can have an equally detrimental effect on AI pregnancy rates. One of those dramatic changes that occurs is when heifers developed in the feedlot are moved to grass, going from a total mixed ration offered in the bunk to selecting their own nutrition.

In addition to the dramatic change in diet, heifers are also extremely active when turned out on grass as they adapt to their new environment. Because it has been observed that heifers can lose a significant amount of weight in the first week on grass, ways to overcome this negative energy balance should be considered.

If supplementation is an option, be aware of the protein content of the forage. In most early summer situations, when grass is growing quickly, there is sufficient and very digestible protein. In this situation, we would want to address the energy deficiency and supplementation can be as simple as offering corn or low protein range cake. However, if protein is deficient – either through quality or quantity, supplementation is necessary. It would be recommended that they are maintained on appropriate mineral, preferably one that contains organic trace minerals.

## Summary

A successful AI program starts early, requires significant attention to detail, and must be followed throughout the breeding season. It starts with managing average daily gain and body condition while providing the appropriate vitamins and trace minerals. It continues with following synchronization protocols, timing of transportation, and managing the changes to their diet. More pregnancies are always the goal – and the ultimate payout of this process!