

**Beef Heifer Development**  
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The goal of heifer development is to maximize reproductive efficiency in our herds. Reproductive efficiency is the number of live calves weaned from the number of cows/heifers exposed to the bull. For a cow/calf producer, the major critical control point for profit is weaning a live calf each year from as many cows possible. That is more important to our bottom line than the weight of the calves or the quality of the calf we produce. It costs us the same amount of money to have a cow around that produces a calf each 12 months as one that produces a calf every 14 months. The one just gives us more income for the cost of production. So how do we achieve this goal?

First let's discuss three critical parameters related to our production.

1) Cows that calve early in the calving season each year will produce more pounds of calf than cows that calve late. A review of many years of Chaps production records shows that for each 21 days a calf is born later in the calving season, we lose 39 pounds. If a calf is worth \$1.00 per pound at weaning, then we lose about \$40.00 for each heat cycle the calf is born late. This is true for a defined breeding period and for herds that calve all year. For herds that calve all year, cows that have a calf each 12 months make us more money (produce more pounds of calf) than cows that have a calving interval that is greater than 12 months. Again, for every 21 days the calving interval is greater than 12 months the loss is about \$40.00 compared to cows that calves on time each 12 months.

So how do we get cows to calve early each year?

2) Heifers that breed early in the breeding season are more likely to breed early each year as a mature cow. We have all experienced the heifer that bred late as a first calf heifer and how difficult it was to get her to breed the second time. The most costly cow in the herd is the first calf heifer that did not breed back for her second calf. Once a cow is late in the calving season, it is difficult to get her caught up again.

3) In order for a heifer to breed early in the breeding season, she must come into heat early. We get a 25% increase in heifers settling on their first breeding if they are in their third heat cycle compared to those heifers exposed to a bull on their first heat. We would like to breed our heifers thirty days prior to the cow herd so they have an extra 30 days to recover from calving and have better opportunity to settle for their second calf. With a 283-day gestation, bred 30 days before the cows on their third heat cycle then our best breeding heifers will have to reach puberty (have their first heat cycle) at 11- 12 months of age. Two years old is  $365 \times 2 = 730$  days – 30 days bred before the cows = 700 – three heat cycles 63 days =  $637 - 283$  day gestation = 354 days old at puberty.

To achieve our goal of reproductive efficiency we first need to get heifers that reach puberty at an early age. **The major factors that effect age at puberty and reproductive efficiency in beef cattle are nutrition and genetics.** Research has shown that if we can get heifers to 65% of their mature weight at breeding time we can get the most heifers settled at the least cost. To begin the process we need to start at weaning and determine the mature weight for each heifer. We can measure their height at the hip and if we know birth dates, we can look in Beef Improvement Federation charts to determine frame score

and mature weights. Multiply the mature weight by 0.65 and we can calculate our “target weight” for breeding. You can then calculate the average daily gain needed to reach this target weight by subtracting the weaning weight from the target weight, determining the number of days until breeding, and dividing the weight left to gain by the number of days remaining. Your county extension agent can help you formulate a ration to reach these goals. As we approach breeding time we will have a contemporary group of heifers that were all fed to get to their target weight and the factor that is left to determine which of these heifers will reach puberty early is the genetics of each heifer. There is a considerable variation in the genetic age at puberty of heifers. About 70% of heifers that are fed to reach 65% of their mature weight reach puberty at breeding time. Anderson and co-workers at Colorado State University developed a technique for detecting the heifers that have reached puberty. They developed a method of palpating the reproductive tract and a scoring system to evaluate puberty in heifers called reproductive tract scoring (RTS). Using this technology, your veterinarian can evaluate a group of heifers and predict which individual heifers will more likely settle early in the breeding season. Heifers that are unlikely to settle early can then be culled from the heifer pool and marketed more profitably.

Other management practices that will effect heifer reproduction are the control of infectious diseases and parasites and heat synchronization. Your veterinarian is the best source of information on which health programs are necessary in your area. Common recommendations for vaccinating replacement heifers would include IBR, PI3, BVD, BRSV, 7-way Blackleg, and 5-way Lepto at weaning (4-7 months of age). Be sure to use a modified live virus vaccine. Dehorning should be done as early as possible. Boosters for IBR, BVD, and 5-way Lepto should be given 30 to 60 days prior to breeding, this is also a good time to have your veterinarian measure pelvic area and do reproductive tract scoring. Heat synchronization for heifers is a management tool used to increase the number of heifers that are cycling early in the breeding season and at the same time. This usually includes AI breeding of the synchronized heifers but can be employed with bulls if enough bull power is available. Synchronization can be accomplished with an MGA/Lutalyse protocol or by using CIDR's and Lutalyse. Your veterinarian and county extension agent can assist you with your heifer development program.

Heifer development is critical to the profitability of a cow calf operation. The protocols for heifer development have been well researched and applied at numerous sites including the Georgia heifer evaluation and reproductive development (HERD) program. The techniques and procedures used to develop heifers are easily obtained from your veterinarian or extension office and can be applied to your farm with a little effort. These protocols will help you maximize your total herd reproductive efficiency and profitability.