

Management and Reproductive Performance in Replacement Heifers

Profitable beef production occurs only when maximum pounds of beef are produced at a least-cost figure. When evaluating cow-calf efficiency, the percent calf crop weaned ranks first. This means that reproduction is the most critical aspect of beef herd management, and replacement heifer selection and care determines future efficiency of your herd.

Unfortunately, most beef producers view the heifer as just another female. A replacement heifer that has been sired by an above-average bull deserves a better fate than to be put on a low-energy diet, placed with the mature cow herd, bred at will to a bull of unknown quality, and allowed to calve at random without having appropriate nutritional energy to enable her to return to heat and rebreed on schedule. This leaflet reviews the management skills needed for replacement heifers to be reproductively efficient.

Why Calving Season Is Critical

No business today is profitable unless it is efficient. A beef herd can be efficient only when there is an established breeding and calving season. Some reasons to support a calving season are:

- (1) Nutritional requirements can be met better (dry cows and wet cows cannot be fed together efficiently).
- (2) Winter-born calves outperform summer- and fall-born calves (summer-born calves face a winter of declining milk flow and poor quality rations).
- (3) Nutritional requirements for rebreeding are met best in the spring (cows that calve in the summer and are due to rebreed in the fall face grasses of lower nutritional quality, and thus, they are forced to work against nature).

- (4) Records can be kept only when there is a starting and ending point (calving year round is not conducive to record keeping).
- (5) Records are meaningful only when herd mates are performing in the same environment.

Successful businesses today must keep accurate records or their future will be limited.

Puberty in Replacement Heifers

Heifers can be bred only when they reach puberty (sexual maturity). Therefore, we need to be aware of factors that influence puberty. The factors most often associated with puberty are age, weight, and breed. Age at puberty may range from 6 to 18 months, and it can be delayed up to 2 years under adverse conditions.

The most critical factor influencing puberty appears to be weight. Table 1 indicates the percentage of heifers reaching puberty at different body weights. Close examination of this table shows just how important weight is in predicting heat (puberty) in heifers for various breeds.

Table 1. Estimates for heifers reaching puberty at various weights

Breed	Heifers Reaching Puberty	
	70% in heat	90% in heat
		lb
Angus	600	650
Brahman	725	750
Brangus	650	700
Charolais	750	775
Hereford	650	700
Santa Gertrudis	725	750
Shorthorn	600	650
Simmental	750	775

Weight differences appear very small between the columns in Table 1; however, this 25- to 50-lb difference reflects an additional 20% of heifers reaching puberty and cycling so they will be ready to breed. The larger breeds must have more size and reach heavier weights than smaller breeds before a comparable percentage of heifers are cycling.

Achieving the desired growth on heifers will require additional feeding from weaning through the breeding season. Table 2 shows the actual weaning weight of heifers, days from weaning to the start of the breeding season, and the average daily gains necessary to achieve 775 lb for Charolais heifers. Remember, Table 1 tells us that 775 lb is necessary at the start of breeding season if at least 90% of this breed is to be cycling. The lightest heifer should reach this minimum weight, not the average of the group.

Table 2. Heifer weaning weight and weight gains needed by breeding season

Actual Weaning Weight, Sept. 1	Days to Breeding Season, Feb. 1	ADG to Achieve 775 lb
400 lb	150	2.50
550 lb	150	1.50
600 lb	150	1.17

A number of vital points concerning development of replacement heifers can be shown from the information in Table 2. First, you must know the actual weights of heifers at weaning and the number of days until the start of breeding season. From this information, calculate the average daily gain (ADG) needed to reach target weight and develop a feeding program that will have heifers cycling at the desired time.

In the example used, Charolais heifers weighing 400 lb at weaning time should not be considered as replacements. These lightweight heifers would require 2.5-lb daily gain, and this would fatten the heifers too much. Angus heifers weighing 450 lb at weaning with a target weight of 650 lb would be acceptable, as the Angus ADG would be 1.33 to reach target weight.

Know the target weight for your breed. Also, be aware that average daily gains of more than 1.50 lb

per day between weaning and breeding will fatten the heifers. This means that heavier weaning weights are necessary for “growing out” heifers properly.

Heifer Management for Reproductive Efficiency

Proper management of replacement heifers boosts the level of production substantially and has a positive effect on the reproductive efficiency of the cow herd. Today’s replacement heifer must meet the following criteria to deserve her place in the efficient beef herd:

- (1) breed at 14-15 months of age,
- (2) calve as a 2-year-old,
- (3) calve every year (maintain a 365-day calving interval),
- (4) calve with ease, and
- (5) produce a desirable calf (one weighing better than 500 lb at weaning and/or in the top 80% of the herd).

Calving as a 2-year-old gives one extra calf during the cow’s lifetime, and this should not be overlooked. The beef cow is a functional unit that becomes less efficient when her calving interval is extended. Also, calving ease is critical to calving interval and efficiency; problems with calving lengthen the rebreeding period.

Today’s annual cow cost is an arguable figure, but it ranges between \$250 and \$300. It requires very little math to realize that calf weights below 500 lb are not profitable in most years. Proper management skill will allow replacement heifers to meet the criteria of being both efficient and profitable.

Remember these points in managing your replacement heifer from weaning through breeding, calving, and rebreeding:

Selection at Weaning

- Retain only heifers with heavy (actual) weaning weights.
- Retain only heifers born within first 60 days of calving season.
- Retain more heifers than needed for replacement (25% more).

Weaning through Breeding

- Identify replacement heifers; that is, tattoo and ear tag or brand.
- Determine weight of heifers at weaning.
- Determine target weight for breeding.
- Calculate days to breeding and average daily gain (ADG) necessary.
- Feed to meet calculated gains. Heifers may need grouping. Each heifer should be fed to target weight, not the average.
- Keep replacements as a unit (do not mix with cows).

At Breeding Time

- Cull light and/or unsound heifers.
- Keep replacements as a unit (do not mix with cows).
- Breed 20-30 days before regular breeding season.
- Select bull for calving ease.
- Breed for 45-60 days only; remove bull.
- Continue feeding for gain throughout breeding season.

After Breeding

- Graze high-quality pastures.
- Keep replacement heifers as a unit (do not mix with cows).
- Pregnancy test 60 days after end of breeding season.
- Market all open heifers.
- Keep replacement heifers growing and in good moderate condition at calving time, not fat.
- Do not feed high protein diets during the last 3 months of pregnancy.

At Calving Time

- Move heifers into easily accessible area for observation.
- Observe two or three times per day.
- Render assistance immediately as needed.
- Feed new mothers with calves a high energy/ protein ration.

After Calving through Rebreeding

- Feed to gain $\frac{1}{4}$ to $\frac{1}{2}$ lb per head per day.
- Keep replacement heifers as a unit (do not mix with cows).
- Breed for 60 to 90 days. Breed at same time as regular cow herd or starting 2 weeks ahead.
- Pregnancy test in fall and sell all open cows.
- Put replacement heifers into cow herd only after rebreeding with their third calf.
- Remember, quality replacement heifers are valuable; they are the future, so treat them accordingly.

Summary

1. Select replacements from those heifers born early in the calving season. They are out of the reproductively efficient cows and will be older and heavier at breeding time.
2. Know actual weaning weights and feed to reach minimum target weight. Weight at breeding time is critical for breeding success.
3. Start breeding 20 to 30 days ahead of the cow herd. This allows special attention at calving and allows "extra" time before rebreeding for second calf.
4. Breed replacements for 45 to 60 days. Remove bull immediately.
5. Pregnancy test 60 days after the end of breeding season and cull all open heifers.
6. Keep replacements in a group to themselves. Mix with mature cows only after they are bred with third calf.
7. Use sire summaries and EPDS when selecting sires and ensure positive maternal trait results.

Prepared by H. W. Webster, Extension Animal Scientist