

Nutritional considerations for developing replacement heifers

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The replacement heifer represents the productive future for the cow/calf herd, and her early development and reproductive performance is the best indicator of how she will perform later in life. So it is extremely important that that heifer is given every chance at a productive life. Often the greatest limiting factor to successful heifer development is attainment of puberty. Heifers that reach puberty later, will likely calve later in the season, and may not rebreed for the second calf in time to catch up with the rest of the cowherd. Thankfully, many of the factors that affect attainment of puberty can be managed with a good nutrition program and a good selection program.

A good starting point in determining the feeding strategy for your replacement heifer program is determining what their expected mature size will be. This can be accomplished by looking at the mature cowherd (if heifers are retained from your own herd) or by asking the seller how large the heifer's dam is. After an expected mature size is determined, target weights for breeding and calving can be calculated. A good rule of thumb is that heifers should be approximately 67% of their mature weight at breeding. From there, we can determine what gains we should target during the development period. For example, a heifer with an expected mature weight of 1100 lbs. should weigh approximately 740 lbs. at breeding. If she is weaned at 6 months of age at 450 lbs. and breeding is planned at 14 months of age, she needs to gain a total of 290 lbs. over a 240 day period. This gives a targeted average daily gain (ADG) of 1.2 lbs. per day.

Once targeted gains are determined, then it is time to determine forage and supplement availability to reach those goals. It is very important to have the knowledge of the quality of your hay or forage when developing heifers. From this point, we can determine if the forage is enough to meet the needs of the growing heifers. Often, the forage alone is not be enough to meet the requirements of the heifer for growth.

Supplements should then be formulated to meet the needs of the heifers over that provided by the forage. Heifers should always be provided a complete mineral and vitamin supplement. Typically, rations are balanced to meet energy and protein needs of growing heifers. Table 1 gives energy and protein requirements of heifers with an expected 1,100 lb. mature weight. It is important to weigh heifers several times throughout the development phase, and alter diet compositions based on the actual gain of the heifers. The amount of feed fed can be adjusted as gains increase or decrease. It is important to keep heifers on target to avoid heifers being over or under conditioned at breeding time.

While it is important for heifers to reach targeted weights during the development phase, the timing and rate of gain can be altered to match forage or feed availability during that time. Although feeding to gain at a consistent rate is most common in a heifer development program, it is possible that forage quality and availability might be greatest at the front of the development period. If this is the case, heifers can be managed to reach higher gains early, reaching the target weight sooner in the growing period. Feed costs can then be saved later in the development period as heifers merely need to be fed to maintain weights. It is very important that heifers are not overfed during the development period and allowed to become too fat. Heifers with too much fat may not only have problems getting bred, but they also may accumulate fat in their mammary

tissue. If fat is accumulate in the mammary tissue during development this may have a lifetime impact on the heifer's milk production.

Table 1. Growing Heifer Nutrient Requirements: 1,100 lb at Finishing¹

Body weight, lb	ADG, lb	Dry matter intake, lb/day	Diet Nutrient Density		Daily Nutrients / Animal	
			TDN, % dry matter	CP, % dry matter	TDN, lb	CP, lb
400	0.5	9.8	54	8.7	5.3	0.85
	1.0	10.4	59	10.4	6.1	1.08
	1.5	10.7	64	12.1	6.8	1.30
	2.0	10.7	69	14.1	7.4	1.51
	2.5	10.6	75	16.3	8.0	1.72
	3.0	10.2	83	19.0	8.5	1.94
500	0.5	11.6	54	8.4	6.3	0.97
	1.0	12.2	59	9.8	7.2	1.19
	1.5	12.6	64	11.2	8.1	1.41
	2.0	12.7	69	12.8	8.8	1.63
	2.5	12.5	75	14.7	9.4	1.84
	3.0	12.1	83	16.9	10.0	2.05
600	0.5	13.2	54	8.2	7.1	1.08
	1.0	14.0	59	9.4	8.3	1.31
	1.5	14.4	64	10.6	9.2	1.53
	2.0	14.6	69	11.9	10.1	1.74
	2.5	14.4	75	13.6	10.8	1.95
	3.0	13.8	83	15.7	11.5	2.17
700	0.5	14.9	54	8.0	8.0	1.19
	1.0	15.8	59	9.0	9.3	1.42
	1.5	16.2	64	10.1	10.4	1.64
	2.0	16.3	69	11.4	11.2	1.85
	2.5	16.1	75	12.8	12.1	2.06
	3.0	15.5	83	14.6	12.9	2.27

¹ADG = average daily gain; TDN = total digestible nutrients; CP = crude protein
Adapted from NRC, 2000. NRC Nutrient Requirements of Beef Cattle, 7th revised edition

A good nutritional plan is a critical point that should be given a great deal of thought and thoroughly planned for any heifer development program. By designing a nutritional program to take full advantage of forage available, a significant cost savings may be realized. It is important to plan ahead, and determine the nutritional needs of the heifers, quality of the forage available, and any supplement that may be needed. While it may seem like a daunting task and a great deal of work, planning ahead is a crucial step in developing replacement heifers and ensuring their reproductive success as mature cows.

For more information about beef cattle production, contact an office of the Mississippi State University Extension Service, and visit extension.msstate.edu/beef.