

GENERAL PRINCIPLES OF HEIFER NUTRITION

The fact a heifer is non-productive for the first 2 years makes it very tempting to ignore her special nutritional and management needs. Because 10 to 20% of the cow herd is typically replaced by heifers each year, heifer selection and development decisions significantly affect an operation's productivity and profitability. The development of replacement heifers can be divided into four main phases:

1. **Preweaning**
2. **Weaning to Breeding**
3. **Breeding to Calving**
4. **Calving to Rebreeding**

- **Preweaning**

During this phase, the cows nurture and care for the heifer calves prior to weaning. However, producers are encouraged to individually identify both calves and cows so that the selection of replacement heifers can be based upon objective records of birth dates and weaning weights from consistently early calving, high producing cows.

Many producers have questions on implants and creep feeding during this phase. Regarding implants, the general recommendation is not to implant replacement heifers, due to possible negative impacts on reproductive performance. Creep feeding is another common practice which is not recommended for replacement heifers. This is particularly true in situations where cows are good milkers and lush grass is available.

- **Weaning to Breeding**

When selecting replacement heifers, it is important to select the early born, growthy heifers, because these females are more likely to be cycling at breeding time. This also represents an indirect selection for fertility and milk production since the larger heifers tend to be out of the earlier calving, heavier milking cows. Criteria should also include structural soundness, frame size, fleshing ability and disposition.

Heifers cannot calve early if they do not cycle and conceive early. In order for this to happen, adequate nutrition must be provided. Replacement heifers need to be fed separately from the mature cows. Due to their size, age and increased nutrient requirements, they cannot compete with the rest of the herd, nor can they be expected to efficiently utilize poorer quality forages and still breed as yearlings. Energy and protein supplementation is important. Research documents the negative effects of insufficient postweaning energy supplementation on the percentage of heifers breeding as yearlings, first calf weaning weight and rebreeding for the second calf.

Heifers should be fed so that they will be 65% of their mature weight at breeding. For this to occur, the minimum nutrient requirements in Table 10 should be met. These are only guidelines. The heifer's body condition and weight gain should be periodically evaluated. Ionophores should be used when possible to increase average daily gain and decrease the age of puberty, resulting in animals being bred at a earlier age.

Table 10. Major Nutritional Requirements of Replacement Heifers

Replacement Heifers:								
Body Weight ^b	Daily Gain	Crude Protein Lb/Day	NEm Mcal/Day	NEg Mcal/Day	TDN ^c Lb/Day	Calcium Grams/Day	Phos. Grams/Day	Vit. A IU/Day
400	1.5	1.2	4.10	2.06	6.9	20	11	10,000
500	1.5	1.3	4.84	2.44	8.2	19	12	12,000
600	1.2	1.3	5.55	2.79	8.8	19	13	14,000
700	1.2	1.4	6.24	3.13	9.9	19	14	16,000

^aAdapted from National Research Council, "Nutrient Requirement of Beef Cattle," 1984

^bAverage body weight during feeding period.

^cThe energy (TDN) levels reported are sufficient in relatively mild climates. As a general rule, the amount of TDN should be increased by 1% for each 1°F decrease in the wind-chill temperature below 30°F for cattle with dry, winter hair or below 55°F for wet or summer hair coats.

- **Breeding Until Calving**

It is important to have the heifer gaining weight at all times during this phase. Also remember that most of the fetal growth occurs during the last 60 days prior to calving. Therefore, adequate nutrition is essential for proper development of the fetus and to prepare the heifer for calving and lactation. Research has consistently shown that "roughing" the heifer the last few months prior to calving results in the following.

1. Lighter, weaker calves at birth without any decrease in calving difficulty
2. Greater calf sickness and mortality
3. Lower milk production
4. Slower return to estrus
5. Poorer overall reproductive performance

Although during the 70s, researchers thought that protein supplementation increased calf size which was responsible for dystocia (calving difficulty), producers should be warned not to underfeed protein to the gestating heifers. Current research shows that low protein feeding during gestation resulted in decreased calf vigor, delayed uterine involution, increased interval to estrus and decreased conception rates following calving. The 1984 NRC nutrient requirement tables included in this section provide basic guidelines for bred heifers.

- **Calving to Rebreeding**

The nutrient requirements of heifers drastically increase after calving. She must lactate, continue to grow and prepare her body for rebreeding. Feed will be used for maintenance, growth and lactation before reproduction. Therefore, underfed heifers will have a longer postpartum interval and may even fail to rebreed for their second calf. Nutrient requirements for lactating first calf heifers are listed in the 1984 NRC tables. Remember that this is only a guide. Genetic potential for milk production greater than 10 pounds per day and environmental conditions can dramatically increase the heifer's requirements. The producer should let body condition scores and weight be the determining factor in the feeding program.