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## G87-851 Improving Reproductive Performance and Productivity of Beef Herds

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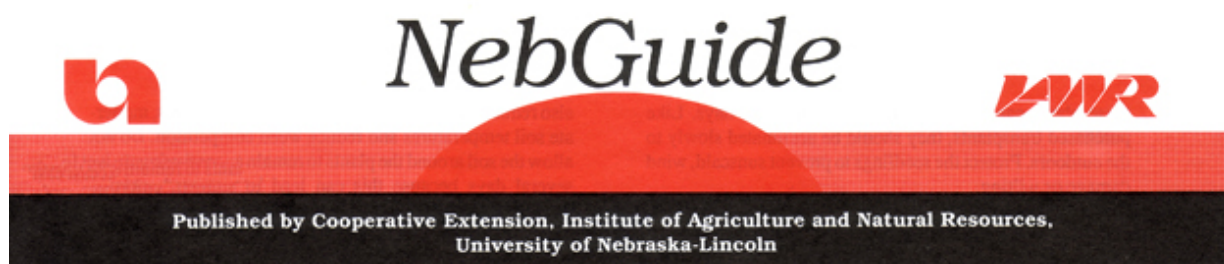


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## Improving Reproductive Performance and Productivity of Beef Herds

NebGuide discusses management practices that can be used to improve reproduction and productivity of beef herds.

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The major objective of cow-calf producers should be to **wean a calf from each cow every year**. The average calf crop weaned in Nebraska is estimated at 80 calves weaned per 100 cows in breeding herds. A realistic goal is 90 to 95 calves weaned per 100 cows.

Cow herd productivity involves both percent calf crop weaned and calf weaning weights. Assuming annual production costs of \$275 per cow, the effects of percent calf crop weaned and calf weaning weights on estimated breakeven calf prices are shown in *Table 1*. In general, a 5% increase in calf crop weaned decreases the breakeven calf price by 4 cents/pound. Also, a 5% increase in calf crop is equal to a 25-pound increase in average calf weaning weight. However, possible increases in costs associated with increased production must be compared to potential returns. Producers can improve reproductive performance and production efficiency by using these management practices:

1. Individually identify cows and calves and maintain a simple record-keeping system.
2. Provide proper nutrition to meet nutrient requirements of cows at various stages of production.
3. Observe cow body condition and feed accordingly to maintain the best condition.

4. Develop replacement heifers for early puberty and early conception.
5. Use a limited breeding season to concentrate the calving season.
6. Use a planned crossbreeding program to obtain advantages of hybrid vigor.
7. Manage bulls for high fertility to achieve high conception rates.
8. Pregnancy examine all females and cull those not pregnant or those physically impaired.
9. Maintain a good herd health program to prevent reproductive diseases and abortions.
10. Provide proper care and early help at calving to reduce calf losses.
11. Consider other practices when appropriate such as: estrous synchronization, artificial insemination, 48-hour calf removal and prebreeding season bull exposure.

**Table I. Effects of calf crop percentage and calf weaning weights on estimated breakeven calf prices<sup>a</sup>**

	Calf weaning weights (lb)			
Calf crop percent	400	450	500	550
	----- Breakeven calf prices (cents/lb) -----			
100	.69	.61	.55	.50
95	.72	.64	.58	.53
90	.76	.68	.61	.56
85	.81	.72	.65	.59
80	.86	.76	.69	.63
<sup>a</sup> Estimated breakeven prices cover annual costs of \$275/cow. They do not account for any extra costs associated with increased production.				

## 1. Identify Cows and Maintain Records

Individual cow and calf identification is needed for efficient management. Identification is beneficial for pairing up, treating sickness, and recording physical problems. Individual identification and calf weaning weights are useful in determining cow productivity and for culling and selection decisions. A simple, workable record-keeping system is important. Use records to determine pregnancy rate, length of calving season, culling rates and calf mortality percentages. Records are necessary to assess performance and determine changes needed.

## 2. Provide Proper Nutrition

Nutrition is one of the most important factors influencing reproductive performance. Adequate levels of protein, energy, minerals, and vitamins are needed to meet nutrient requirements of cows during various periods of production.

- **Period 1** is the interval from calving to breeding (82 days); a period when nutrient requirements are greatest. The cow is at peak milk production, is recovering from stress of calving and is expected to cycle and conceive by the end of this period or shortly thereafter.
- **Period 2** is from breeding to weaning (123 days) and nutrient requirements are high because of continual milk production and a need for body weight gain. However, forage availability is usually adequate during this period, for a spring calving program; therefore, requirements are met from grazing of summer pastures.
- **Period 3** extends from weaning to 50 days before calving (110 days) and has the lowest

nutrient requirements. The cow only has to maintain body condition and supply nutrients for fetal development. However, thin cows at weaning should be separated and fed to gain weight and body condition by calving. Fat cows could also be separated and fed less to reduce condition and feed costs.

- **Period 4** is the critical period during the last 50 days of pregnancy. The fetus is growing rapidly (about .75 lb/day) and the cow needs extra nutrition for the fetus to be strong and healthy. Generally, the cow should gain at least the weight of the fetus and placenta (about 100 to 125 lb) during the total gestation period and also be in good body condition at calving.

Inadequate nutrition before calving can cause weak calves at birth and delay return to estrus after calving. Lack of sufficient nutrients after calving decreases milk production, slows return to estrus, and decreases conception rates. Cows should be in moderate to good body condition at calving for high conception rates early in the breeding season. If cows lose weight and condition before and after calving, both calf weaning weights and conception rates will be reduced.

To meet essential nutrient requirements of cows, a producer should analyze the major roughages for nutrient content and then add supplements to provide a balanced ration. Both underfeeding and overfeeding supplements can be expensive. Detailed information on nutrition can be found in NebGuide G80-489.

### **3. Observe Cow Body Condition**

To determine whether cows on pastures or range are receiving adequate nutrients is difficult; however, cow body condition can be used as an indicator. A high relationship exists between body condition (fatness) and rebreeding performance. Producers can monitor the body condition of cows and adjust feed levels accordingly.

A visual scoring system can be used to determine if feed levels need adjustment. Following is a brief description of the body condition scoring system:

- 1 - 3. Very thin to emaciated, ribs and backbone visible, notable lack of muscling.
- 4. Thin, with ribs and backbone visible but fair muscling over hindquarters.
- 5. Moderate, last ribs visible, fair muscling but no evidence of fat.
- 6. Good, smooth appearance, some fat in brisket and over ribs and back.
- 7. Fleishy, brisket filled with fat, ribs smooth, back appears square due to fat.
- 8 - 9. Obese to very obese, heavy fat in brisket, udder, and around tailhead, back very square and neck thick and short.

In Texas and Oklahoma research, cows with a condition score of 4 at calving had a 15 to 25% lower subsequent pregnancy rate than cows with a score of 6 at calving. According to these results, cows should be in moderate to good condition (scores 5 to 6) at calving to insure good reproductive performance. Evaluate condition of cows at weaning and again at two months before calving. Separate thin cows (score of 4 or lower) from the other cows and provide extra feed so that a moderate to good body condition is achieved by calving. Monitor cow condition closely during the winter as body condition can decrease rapidly during inclement weather.

### **4. Develop Heifers Properly and Breed Early**

If replacement heifers are to be productive cows, they must calve early in their first calving season. This means proper selection, feeding, and breeding. Select older heifers of adequate development at weaning or as yearlings. They should be sound, thrifty heifers with sufficient skeletal and pelvic size

to minimize dystocia when two-year-olds. More heifers than needed should be saved for breeding (20 to 25% extra) so only those that conceive early need to be used as replacements. Heifers need to be fed to gain 1 to 1.25 lb/day after weaning in order to be cycling by breeding time at 14 to 15 months of age. Puberty is a function of breed, age, and weight. Heifers generally need to attain 60 to 65% of their projected mature weight before regular estrous cycles occur. ( NebGuide G80-493 has more information.)

The breeding season for yearling heifers could start 2 to 3 weeks before that of the cow herd and should last no longer than 40 to 45 days. These practices force heifers to calve early in the calving season so they will have more time to cycle and rebreed for their second calf with the mature cows. Estrous synchronization and AI can help facilitate a short breeding season (possibly 30 days), concentrate the calving period, and allow the use of proven, easy calving bulls.

Bred heifers should gain about 1 pound daily during the last trimester of pregnancy to provide adequate nutrients for the fetus plus continue structural growth to reduce calving difficulty. First calf heifers need special care and should be kept separate from the cow herd so they can be fed to meet their nutrient requirements. Feeding extra energy and protein after calving is required to optimize reproductive performance of heifers. (Further information on managing heifers is in NebGuide G80-495.)

## **5. Limit the Breeding Season**

A limited breeding season is important for improving herd fertility and productivity. It produces a short calving season which allows concentration of time and labor, results in heavier and more uniform calves at weaning, and greater economic returns. Cows calving during the first 20 days of the calving season can wean 100 pounds more calf than cows calving during the fourth 20 days of an 80-day calving season. By limiting the breeding season, cows with a history of breeding and calving late will be open and forced out of the herd. A 60-day breeding season should be enough for most herds barring drought or unusual weather. After bulls have been removed for 60 days, cows should be pregnancy examined and the open ones culled. If bulls are not removed until weaning time, the late bred cows can still be identified at pregnancy exam and removed from the herd.

Many factors need to be considered in determining when the breeding and subsequent calving season should begin. Feed resources, environmental conditions and labor, plus marketing alternatives are most important. If the highest cow nutritional requirements can be matched with the greatest forage supply, then reproductive performance should be enhanced. For example, in a spring calving program, beginning the breeding season 20-30 days after turning out to good spring grass may be the best timing.

## **6. Plan a Crossbreeding Program**

Commercial producers should consider a crossbreeding program to utilize hybrid vigor for improving reproduction and total productivity. Crossbreeding results in a higher calving percent (4%), a greater calf survival rate (3%), and increased weaning weight (10%), compared to straightbreeding. In addition, the opportunity to combine the best traits of various breeds makes planned crossbreeding quite beneficial.

## **7. Manage Bulls Properly**

The herd bull provides a great opportunity for improving herd productivity. The bull influences calving percentage as well as growth rate and quality of calves. Use performance tested bulls

evaluated using breeding values for growth and maternal traits plus reproductive capabilities. Buy bulls preferably 60 days before the breeding season to adapt to the new environment. Give recommended vaccinations for reproductive and other diseases (such as IBR, BVD, Haemophilus, Vibrio and Lepto) about 30 days before the breeding season. Conduct a breeding soundness examination consisting of a thorough physical exam, scrotal measurement, and microscopic examination of semen on all bulls (see NebGuide G83-666 for details). Scrotal circumference is a good indicator of sperm production and quality and should be used in selection of young bulls. Pelvic size in bulls is also important as the trait can be transmitted at a moderate level from sire to offspring.

Fertile bulls may still have low mating behavior (libido) and should be watched closely during the early breeding season to determine adequate serving capacity. General recommendations are to run 25 to 30 cows per mature bull and 15 to 20 cows per yearling bull. These ratios will vary depending on the pasture, terrain, and the bull's sexual aggressiveness. Yearling bulls may require special management to improve performance and prevent loss of weight by rotation between pastures, extra feed, and a shorter breeding season.

## **8. Pregnancy Exam and Cull Cows**

Pregnancy determination is important to improve reproductive efficiency. Identifying non-pregnant cows and cows bred late in the season allows them to be removed from the herd to avoid winter feed costs. The remaining cows in the herd will be the most profitable. Pregnancy exams are usually given at weaning time when the cows are gathered and worked. At this time, examine condition of udder, feet, teeth, and eyes and abnormalities of the reproductive tract. Cows may also be given annual vaccinations and treated for lice.

Some producers sell cull cows immediately after weaning. However, if cows are thin or young, a short feeding period on high energy feeds may be profitable. A marketing plan is advisable for the sale of cull cows since they contribute a significant portion to total gross income of a cow herd.

## **9. Prevent Diseases with Herd Health Program**

Reproductive health in the cow herd is a necessity; therefore, a disease prevention program is recommended. Embryonic losses or abortions can occur at any stage of gestation. An attempt to accurately diagnose the cause of abortions should be made by a veterinarian working with the support of a Diagnostic Laboratory to help prevent further losses.

A complete vaccination program should be designed with the help of the local veterinarian. Generally, immunize replacement heifers for brucellosis, IBR, BVD, vibriosis and leptospirosis. Give an annual booster for vibriosis and leptospirosis to the cow herd. Bred heifers and cows may also be vaccinated against rotavirus and coronavirus, E. coli, and clostridium perfringens type C D (enterotoxemia, purple gut) to help prevent calf sickness and losses. Lice should also be controlled. More information on diseases and herd health are in NebGuides G81-574, and G75-232.

## **10. Provide Care and Assistance at Calving**

Five to ten percent of all calves born in beef herds die at or soon after birth. Extra time and labor spent during the calving season can save many calves and is usually cost effective.

Dystocia (calving difficulty) is the primary cause of calf losses and is generally due to a large calf or a cow with a small birth canal (pelvic area). Selecting bulls for ease of calving and smaller birth

weights and selecting replacement heifers with larger pelvic size should reduce calving difficulty. Management at calving should include the following practices:

- a. Have clean facilities and proper equipment in working order before calving.
- b. Observe the herd closely, especially first calf heifers, and separate the "heavies" into a small pasture or lot convenient to facilities for calving. Pair out cows and calves soon after calving to avoid buildup of infectious agents in calving area.
- c. Learn to promptly identify a difficult birth and give proper obstetrical assistance or call a veterinarian. Do not wait more than a few hours after labor begins (or water sac appears) to act.
- d. If necessary, remove mucus from the calf's nose and stimulate breathing to save the calf.
- e. Calf should nurse within an hour after birth. If it does not, give assistance or a supply of colostrum.
- f. For more information on calving management see NebGuide G81-539.

## 11. Consider Other Management Practices

- a. **Artificial insemination and estrous synchronization**--Superior sires are available to everyone through the use of AI to increase growth and productivity. Use only good quality semen, properly handled and inseminated. Estrous (heat) synchronization reduces the time and labor needed for heat detection in an AI program and also concentrates the breeding and calving periods. These practices have excellent potential but require good management. NebGuide G85-741 has more information.
- b. **Short term calf removal**--Removal of calves from cows for a 48-hour period can stimulate hormone production and estrous activity in some non-cycling cows. It can be beneficial for cows (especially two-year-olds) not cycling due to late calving, high milk production, or climatic stress. Separate calves by a corral fence and provide water and hay and/or grain.
- c. **Expose cows to sterile bulls**--Exposure of cows after calving to sterile bulls tends to shorten the interval from calving to first estrus. If marker (gomer) bulls are available, place them with cows early post-calving to stimulate early estrus.

## Summary

The goal of cow-calf producers should be to achieve the level of production which will generate the most efficiency and economic return within available resources. Producers should develop specific production goals such as a 95% calf crop dropped in a 60-day period each year with calves averaging 500 pounds at weaning.

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