

INTEGRATED REPRODUCTIVE MANAGEMENT

LEAN
COPY

PART I. THE COW HERD

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Calf crop percentage can be defined as the actual number of calves weaned per number of cows exposed to a bull. An ideal situation would be to **wean a calf from each cow, every year**. However, the national calf crop average is approximately 70%, only 70 calves weaned per 100 cows exposed to bulls. A realistic goal is 95 calves weaned per 100 cows exposed to bulls.

A workable record keeping system is imperative if progress in reproductive performance is to be attained. Recording herd information such as pregnancy rate, length of calving season, culling rates and calf mortality is invaluable in assessing performance and determining what changes need to be implemented. Individual animal identification is equally important when making culling and selection decisions.

There are several excellent performance testing programs available to livestock producers on both a national and state level. Many national purebred organizations offer the service. The North Dakota Cooperative Extension Service and Department of Animal Science, in cooperation with North Dakota's

Beef Cattle Improvement Association, also have a program available to all interested producers.

Nutrition

Nutrition is the single most important factor in maintaining an acceptable short calving interval. The limiting nutrient related to reproduction is usually **ENERGY**. Research results have consistently shown energy deficient rations to have adverse effects on the calving interval. The detrimental effects of energy restrictions in the cow herd manifest themselves by delays in return to heat and poor first service conception.

To realize the greatest dollar return in a beef cow enterprise, cows must be bred to calve as early in each producer's calving season as possible. The cost of late calving in beef cows is significant — every estrus period a cow misses results in a calf that will be about 34 pounds lighter at weaning. When this figure is multiplied by the value per pound of calf at weaning, the loss to the enterprise is significant (Table 1).

Table 1.

COST OF LATE CALVING IN BEEF COWS			
Cows Becoming Pregnant at Various Estrous Periods*	Days	Pounds Weaning Weight Sacrificed**	Gross Loss***
First	21	Maximum production due to calving date	
Second	21	33.6	\$22.85
Third	21	67.2	\$45.70
Fourth	21	100.8	\$68.54

* Assumes breeding season begins 80 days after start of calving season.

** Assumes 1.6 A.D.G. from birth to weaning

*** Assumes weaning weight value of \$68/cwt, with no differential in price due to weight difference.

Feed requirements vary during the reproductive cycle as illustrated in Table 2.

Table 2.

NRC REQUIREMENTS FOR BEEF COWS OF VARIOUS WEIGHTS BY PERIOD							
Body Wt. (lb)	ENERGY		Daily requirements				
	TDN (lb)	NE _m (Mcal)	Crude Protein (lb)	Digestible Protein (lb)	Ca (gm)	P (gm)	Vit A (IU x 1000)
Period 1 — Calving to Breeding (82 days)*							
900	13.5	13.0	1.8-2.6	1.1-1.6	25-45	25-41	21-34
1100	14.8	14.2	2.0-2.8	1.2-1.7	27-46	27-43	24-38
1300	16.1	15.5	2.2-3.0	1.3-1.8	28-46	28-44	27-43
Period 2 — Breeding to Weaning Calf (123 days)*							
900	9-11	8.7-10.7	1.5-2.1	0.9-1.3	22-41	22-37	21
1100	10-12	9.7-11.6	1.6-2.3	1.0-1.4	24-43	24-39	24
1300	11-13	10.7-12.6	1.7-2.4	1.1-1.5	25-42	25-39	27
Period 3 — Weaning Calf to 50 Days before Calving (110 days)							
900	7.3	6.89	.82	.43	11	11	21
1100	8.6	8.4	.90	.45	13	13	24
1300	9.8	9.33	.99	.49	15	15	27
Period 4 — Last 50 days of pregnancy (pre-calving)							
900	8.7	8.4	1.0	.48	14	14	21
1100	10.0	9.7	1.1	.53	15	15	24
1300	11.2	10.9	1.2	.58	17	17	27

*Requirements depending on milking ability, age and condition.

Period 1 (Interval from calving to breeding). This is the critical stage in the reproductive cycle of the beef cow. Nutrient requirements reach their peak during this period. The average cow will require approximately 70 percent more energy, over 100 percent more protein, about 100 percent more calcium and phosphorous and a significant increase in Vitamin A compared to other periods. Weather conditions during this period can be severe, causing an increase in the cow maintenance requirements. These factors, plus the added requirement of milk production for the calf, are responsible for the increased nutrient needs of the cow. Underfeeding during this period affects two calf crops — this year's and next year's. Inadequate energy consumption following calving results in fewer cows cycling during the early part of the breeding season and lower conception rates.

Period 2 (Interval from rebreeding to weaning the calf). During this period of the reproductive cycle, energy requirements for maintenance and milk production are still substantial. Cows are generally on grass during this portion of the reproductive cycle. When adequate grass is available, pasture satisfies the nutrient needs of the cow. Conditions such as overgrazing and drought can reduce available forage to the point that nutrient needs are not satisfied.

Underfeeding at this point will generally not have any detrimental effects on the developing fetus since its requirements are small. However, milk production will be affected and a lighter weaning weight from the current calf will result. The decision to provide supplemental feed to cows on summer pasture should be based on the severity of overgrazing and drought conditions. Supplemental feeding of the cows on pasture may be a viable alternative only in extreme cases. Creep feeding or early weaning of the calves to compensate for reduced pasture nutrition are generally more economically sound alternatives.

The most limiting nutrient to cows on pasture is generally phosphorous. As forage matures, there is a decline in the level and availability of phosphorous in the plant. A high phosphorous mineral mixture should be offered free choice to cattle on pasture. There are several excellent commercial high phosphorous mineral mixtures available. The producer can also make his own by mixing a source of phosphorous (dicalcium phosphate, bonemeal, defluorinated rock phosphate, etc.) 50:50 with iodized or trace mineral salt.

Period 3 (weaning calf to 50 days before calving). The cows' nutritional requirements are lower during this period of the reproductive cycle than any other time of the year. If cows are in good condition com-

ing off summer pasture, it is an excellent time to take maximum advantage of the poorer quality feeds, such as grazing crop aftermath, feeding straw and poor to medium quality hays, utilizing winter range, etc. The extent to which these feeds can be utilized will depend on the body condition of the cow. Thin cows should be separated and provided additional energy for the forthcoming calving season. What the old rancher said, "If I can get a cow comin' into the winter in good riggin', I got half the battle won," is certainly as true now as it ever was.

Period 4 (a critical stage preceeding calving). Approximately two-thirds of fetal growth occurs during the last 60 days of pregnancy. This period of rapid growth of the unborn calf accounts for a marked increase in the cows nutrient requirements. Cow condition at calving is critical to rebreeding. Onset of heat after calving is delayed in cows losing weight or thin and not gaining (Table 3).

Table 3.

BODY CONDITION AT CALVING AND INCIDENCE OF HEAT AFTER CALVING*						
Body Condition at Calving	Percent Cows Showing Heat Days After Calving					
	40	50	60	70	80	90
Thin	19	34	46	55	62	66
Moderate	21	45	61	79	88	92
Good	31	42	91	96	98	100

*J. N. Wiltbank, 1977

When cows lose weight before and after calving, results may be disastrous. Weight loss after calving increases the time it takes the cow to re-establish normal heat cycles and decreases conception rates. Cows that calve thin have a much higher chance of remaining open. Even if thin cows do become preg-

nant, they will tend to calve late in the season. Weight loss before calving can increase the occurrence of calving difficulties and of weak or still-born calves. Furthermore, underfeeding cows prior to calving tends to increase the likelihood of calves getting scours (Table 4).

Table 4.

CALF PERFORMANCE AND SURVIVAL		
Item	Dam's Energy Intake Last 30 Days of Gestation	
	High	Low
Birth Weight (lb)	66.8	58.7
Weaning Weight (lb)	320	294
Calves Alive at Birth (%)	100	90
Calves Alive at 2 Weeks (%)	100	81
Calves Alive at Weaning (%)	100	71
Calves Having Scours (%)	33	52
Calves Died Due to Scours (%)	0	19
Interval to First Estrus (%)	42 days	50 days

*Corah et al., 1974

Amount of cow feed required per pound of calf weaned during the gestation period is fairly constant. Cows that give more milk require feed with a higher level of protein. When feed is not adequate to meet all needs, milk production is accomplished at the expense of reproductive ability. PROTEIN requirement of young growing stock and heavy milkers is often a limiting factor, while mature dry cows are often overfed protein.

To do a proper job of providing the essential nutrient requirements during various stages of the reproductive cycle, feed analysis of major roughage sources and homegrown grains should be conducted to monitor true nutrient content and actual dollar value. Trace mineral variance is common between and within different geographic areas, which further supports the need to use specific feed analysis information.

