KENPAL FARM PRODUCTS INC

Beef Briefs

The Latest Information on Beef Cattle Nutrition

Successful Calving Seasons

By Pedro Nogueira

Introduction

Several factors influence profitability in cow/calf operations, four major ones are:

- Yearly costs of keeping a cow
- Number of cows exposed to the bull that wean a calf
- Weaning or yearling weight of calves
- Price received for calves and cull cows

Although cow-calf producers have little chance to change the last factor, the first three can be affected by good management. One of the most effective ways to improve profitability of cow/calf operations is by reducing the breeding and calving season. There are a number of reasons for maintaining a short breeding season, as we'll try to explain in this text. For this management tool to be effective, some aspects of the annual cow production cycle must be known and controlled, like the nutrient requirements of the different phases of the cycle and the management of the body condition of the cow. These aspects are intimately related to nutrition, and nutrition is intimately connected to fertility and milk production.

Beef Cow Production Cycle - Developing diets and feeding strategies for the cow herd is facilitated by a basic understanding of the production cycle of the cow and her changing nutrient requirements. By knowing and anticipating the changing nutritional needs of the cow, producers can plan their feeding programs. According to John Hall, Extension Animal Scientist from Virginia University, cows use the nutrients provided to them for bodily processes in the following order: 1) maintenance – keep alive and moving, 2) lactation – providing milk for the calf, 3) growth – including weight gain, and 4) reproduction. As we can see reproduction is the last priority of the cow. This puts more pressure on management practices that improve reproductive efficiency.

For nutritional and most management purposes, the annual production cycle for the beef cow can be divided into 4 phases: Pre-calving, Postpartum, Lactating and Pregnant, and Gestation. Each one of these phases is physiologically unique and each has its own set of nutritional requirements. If a cow is to conceive and calve every 365 days, the average length of each phase can be divided as the following figure on the next page (from John Hall):

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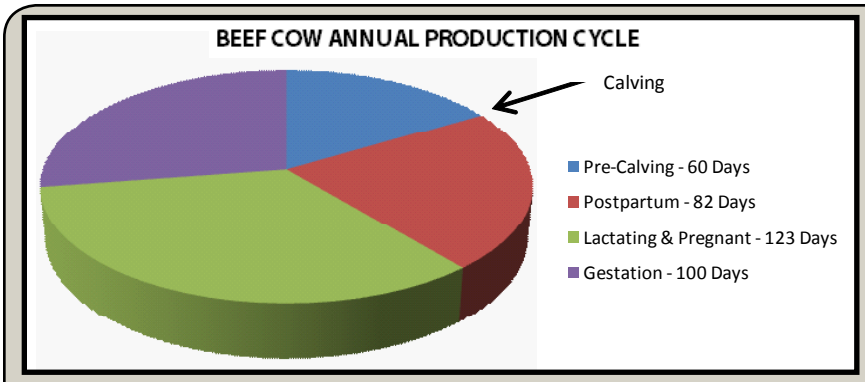
69819 London Road, RR #1, Centralia, Ontario, Canada, N0M 1K0
Tel: (519) 228-6444 or 1-800-265-2904 • Fax (519) 228-6560 • Email kpalen@kenpal.on.ca • www.kenpal.on.ca



Postpartum (after calving) is the 80 to 90 days period that begins at calving. It is the period of greatest nutritional demand. Cows must lactate, repair their reproductive tracts, resume heat cycles, breed, increase activity and, if young, grow. For all of this to happen on a successful way cows must be in good body condition score (BCS). It is very difficult and expensive to change BCS following calving, since the nutrient demands of lactation are very high during this time. The time to manipulate BCS is during the period named **Gestation** in the previous figure. This is the 100-110 day period immediately after the calves are weaned. Nutritional requirements are at their lowest because lactation has ceased. This is the best time to put weight back on thin cows and increase BCS.

Pre-calving is the period 50 to 60 days immediately before calving. This is the most critical period of the year. Cows must reach or preferably maintain body condition score 5 or 6 (1 to 9 scale, 9 = fattest) during this period. Cows must calve in body condition score 5 or greater to have healthy calves and breed back quickly. Energy and protein needs increase by 20% or more compared to gestation. Fetal growth is rapid. The calf may gain 27 kg (60 lbs) during pre-calving, and the placenta is also growing. Along with fetal and placental growth, cows are preparing for lactation. Late in this period feed intake may decrease because the fetus and associated structures take up space normally occupied by the rumen.

There is a debate whether reducing dietary energy and protein during late pregnancy will decrease fetal size resulting in improved calving ease, whereas increasing energy will increase fetal size leading to a higher incidence of dystocia. Generally speaking, research has shown that lowering the energy allowance will decrease birth weight but will not significantly reduce dystocia. Studies with Hereford and Angus two-year-old heifers where they were fed three levels of energy for 90 days prior to calving, showed that increasing the level of dietary energy resulted in increased birth weight but not increased dystocia; in fact, the incidence of calving difficulty was lower in the medium and high energy groups than in the low energy group. Calves were also in better health when cows were fed the medium or higher plane of nutrition than the lower one. Researchers attributed this to the fact that calves from cows on a medium or higher plane of nutrition got up and nursed more quickly than calves from cows on a low plane of nutrition. Time to nurse is critical in getting an adequate amount of colostrum in calves prior to gut closure. Of course overfeeding can be a problem as well. Cows that are overconditioned actually deposit fat in the birth canal which can lead to calving problems.

Why is body condition important? Body condition score (BCS) at calving is closely related to a number of production parameters in the cow and the newborn calf. Dr. Greg Lardy, from North Dakota University, indicates research that clearly demonstrates that calving cows should be at BCS 5 or higher at calving time for optimal reproductive performance the following breeding season.

Table 1 shows BCS of cows and the percentages in heat 60 and 90 days following calving. A greater percentage of cows with BCS 5 or greater at calving will be in heat at the start of the breeding season. If a cow is in heat at the beginning of the breeding season, the greater the chance that she will breed and calve early in the season, resulting in heavier weaning weights the subsequent fall.

Table 1: Effect of body condition score on cows in heat at beginning of breeding season

	Cows in Heat (%)	
BCS at Calving	**60 days**	**90 days**
Thin (1-4)	46	66
Moderate (5-6)	61	92
Fleshy (7-9)	91	100

Adapted from Missouri Cooperative Extension Service G2230.

On the other hand, another important aspect of a proper BCS at calving is related to the ability of the cow to produce quality colostrum (Table 2). Cows in better body condition will have colostrum with a higher content of immunoglobulins which in turn help protect the calf from disease. Proper energy and protein nutrition is important for cows to maintain or increase body condition. Providing a good quality trace mineral and vitamin supplementation program during late gestation is important to both the cow and the gestating calf, to ensure that calves are vigorous and healthy at birth.

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Table 2: Effect of cow condition at calving on calf serum immunoglobulin level					
	Cow Body Condition Score				
	3	4	5	6	P-Value
Calf serum IgM (mg/dl)	146	157	193	304	.05
Calf serum IgG (mg/dl)	1998	2179	2310	2349	.23
Adapted from Odde, 1997, Proceedings Bovine Connection to Profit.					

Advantages of Short Breeding Seasons - Shortening the calving season is perhaps one of the most important and cost-effective programs that can be implemented by a producer. Short breeding season require well-managed nutritional programs from 60 days before calving through breeding. The length of the breeding season is an important factor in determining pregnancy rate. It has been shown that late-calving cows have smaller calf crops than do early calving cows. The only reliable method for making sure cows calve early in the calving season is to have a short breeding season. A 60-90 day breeding season should be a goal of most cow/calf producers with 45 to 60 days being more desirable.

Dr. Phil Osborne, from West Virginia University, summarizes the reasons to have short breeding seasons in the following way:

1. Marketing - A short breeding season allows for a more uniform calf crop. This is particularly important when participating in a feeder calf marketing pool. Most pools want to market trailer loads of calves of uniform age and within a 45 kg (100 lb.) weight spread. Even in a 70-day calving season your calf crop can have as much as a 57 to 64 kg (126 to 140 lb.) weight spread if the average daily gains are 0.82 to 0.91 kg (1.8 to 2.0 lbs.) respectively.

2. Time and labor - A controlled calving season concentrates time and labor for calving, reduces expenses, and increases efficiency. This is especially important for first-calf heifers and small part-time operations where it is most difficult to closely watch cows. Most calves are lost at the very beginning of the season, when they are not expected, and at the end of a long calving season, where producer fatigue plays a major role. It is very difficult to properly check cows that are on a year round calving season.

3. Herd health - The herd health and management of the cow herd is easier with a shortened calving season. The economically important practices, such as vaccination, castration, identification, deworming, and weaning, are best accomplished with less labor. The length of the calving season greatly influences the timing of pregnancy testing, marketing, culling cows and proper nutritional management. Another aspect involved with herd health is calf health. Our Beef Specialist Jack McCoubrey has practical experience with this aspect. Here's what he has to say: ***"Specifically during winter and early spring calving periods, as the calving period is extended the disease threat becomes greater. Producers will get the first 100 on the ground in the first 30-45 days and then struggle with the last calving, with scours, naval infections, etc. It is advisable to move animals to different pastures, but sometimes, when calving in confinement, we cannot do that, this time of the year."***

4. Nutrition - Brood cow nutritional management can be improved when all cows are in the same stage of production. The winter feeding of the cow herd is the most expensive phase of production. With a controlled calving season, dry cows can utilize stockpile forages and lower-quality hay. High-quality hay can be reserved for nursing cows. Cows nursing calves need 50 percent more protein than dry cows; so, supplementation and expense savings can be better achieved if all cows are in the same stage of production. Neither group can be fed properly if they are running together.

5. Selection - Culling and selection of replacement heifers based on records can be better accomplished. More interest and emphasis are being placed on production and carcass data. Producers need to make comparisons of contemporary groups, which is better achieved in a short calving season. Accurate comparisons between cows cannot be made if the calving season is too extended. Weaning weights will improve along with reproductive performance of the herd if cows failing to breed during the calving season are marketed.

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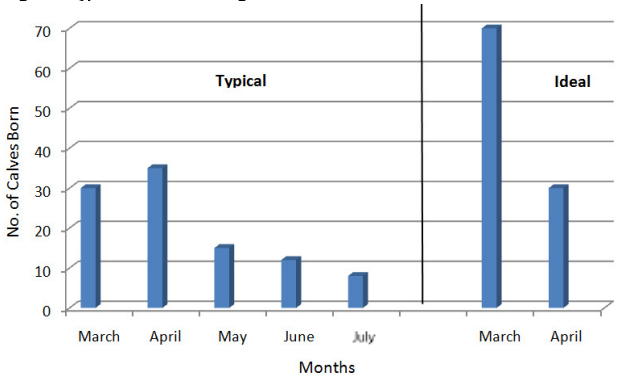
Long calving seasons (more than 90 days) result in a wide range in age of calves at weaning time. If a single weaning date is used, younger calves wean at a lighter weight. The influence of length of the breeding and calving season is illustrated in the next figure, by Tom Troxel, from a publication of the University of Arkansas. Data in Figure 1. assume a birth weight 36.3 kg (80 lbs.) and an average daily gain of 0.91 kg (2 lbs.). The figure compares a 5 month calving season (named "Typical") with an "Ideal" 2 months calving season. Since all calves in the "ideal" calving season of 60 days are older, they are, of course, heavier at weaning. In the 100-cow herd situation, this translates into an extra 2830 kg (6,240 lbs.) of beef weaned or an extra 28 kg (62 lbs.) per calf. If the average weaning weight of 218 kg (480 lbs.) in the 5 month season is assumed, this is the same as having an extra 13 calves for the shortened breeding period (2830 ÷ 218)!

Figure 1. Typical and ideal calvings season in a 100-cow herd.



Adapted from: "Long Calving Seasons: Problems and Solutions". Univ. Arkansas."

There is a belief in the industry that calves born later in the calving season will compensate for their late start and catch up the following winter and summer. Dr. Brian Palichuk, from University of Alberta, though, tells us that the heaviest calves at weaning are normally also the heaviest at 18 months of age. To avoid the loss in returns from late calves, some producers attempt to keep the calves on the cows until they reach an older age and heavier weight. However, this is not a good practice. Continued nursing of the cow late into the season places heavy nursing stress on the cow which reduces her weight gain and prevents her from accumulating fat stores necessary for good reproductive performance during the next year.

Tom Troxel explains that one of the primary objections to moving to a controlled breeding and calving season generally is that limiting exposure of the cows to bulls does not give cows an adequate opportunity to conceive. In fact, this objection has little foundation; a management change from a long to a short calving season does not penalize fertile, productive cows. As the data in Table 3 indicate, cows that are given adequate rest after calving and that have cycled before the start of the breeding season will conceive early in the breeding period. The objective of the table is not to evaluate breeds, but pregnancies by period.

Table 3. Distribution of pregnancies by periods in a 75-day breeding season.

	Breed Type				
Days	**Angus**	**Brahman**	**Brangus**	**Brahman x Angus**	**All Breeds***
	Percentage Pregnant by Periods				
1-21	64	38	49	70	55
22-43	28	22	29	18	24
44-65	7	28	18	10	16
66-75	1	12	4	2	5
TOTAL	100	100	100	100	100

* - Average pregnancy rates by periods for the four breeds.

Note from Table 3 that 55 percent of all the breeds used in this study had conceived by the first 21 days and 79 percent by the end of 43 days. Only 5 percent of the herd conceived during the last 12 days of the breeding season. On the Angus breed, 92% of the cows conceived in the first 2 cycles.

In Summary: When a breeding season extends beyond 60 days, less fertile females are more likely to become pregnant. This makes producers hang on to them for another year. Before you know it you collected a whole group of less productive cows that are out of sync with your normal breeding program and each other.

The only way to avoid this is to **hold firm to the length of your breeding season**, preg check and cull the open cows.

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