34 Choosing a Calving Season

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Objectives

- **Discuss the pros and cons of using fall, spring and both fall and spring calving seasons.**
- **Review the calving season choices available to producers.**
- **Suggest areas producers should consult for future research findings.**

Tradition

Traditional calving seasons in the Great Plains have been closely aligned with Mother Nature's attempt to preserve the species *Bos taurus*. With few exceptions, large mammals in the wild would deliver their offspring in springtime and the lactation and attempts to rebreed, therefore, would coincide with the growing of warm season plants for food. Similarly, cow-calf management schemes have centered on the traditional spring calving season. With a 285-day gestation, early summer breeding seasons are necessary to produce another spring calf the following year. As beef cow operations became more efficient, producers learned the advantages in labor management, feed utilization and market position gained by creating a shorter, more distinct calving season. In the southwest, producers have been able to get the jump on northern plains neighbors by starting the breeding season earlier (April or May) to produce February and March calves. Early spring calves can be weaned earlier in the fall ahead of the glut of northern calves or weigh more at weaning time because they are older. The SouthernPlains and southeastern cattle operations also have the additional option of utilizing cool-season pastures with cows producing fall calves ready to market in spring or summer.

Why Consider Change

Traditional methods of cow-calf management are sometimes severely challenged by the squeeze of very high input prices and low prices for weaned calves. Producers and land-grant university researchers are looking at many nontraditional alternatives. Efforts are being made to reduce input costs and increase the product's value as it leaves the cow-calf operation. In Oklahoma, costs per cow each year are very near the national average reported in Standardized Performance Analysis (SPA) data. SPA reports summarizing Texas, Oklahoma and New Mexico data indicate an average break-even cost of $1.67 per pound of weaned calf ($1.70 per pound when the average was weighted using number of breeding cows). On average, more than one-third of total production costs could be attributed to grazing costs and home-raised feed or purchased feed costs. This cost has given the best opportunity for reduction. During the mid 1990s, calves often sold for much less than the break-even cost. Therefore, examining nontraditional calving and breeding seasons in an effort to discover a much less expensive program for maintaining cows and producing calves was inevitable.

Cow-calf managers determine when the breeding season begins and ends, thus determining when the calving season begins and ends because gestation length is relatively constant. The manager also determines when the calves are weaned and marketed. Breeding, calving, weaning and marketing dates are not strictly the product of Mother Nature, but are managerial decisions that do not have to conform to tradition. It is interesting to note that beef is the only major meat animal species currently allowed to rear its offspring. Is this due to necessity or tradition? Pork and poultry both have lower costs of production.

Lots of Choices

Southern Plains producers have many alternatives for calving seasons. Lengths of seasons vary from 45 days to 365 days. Spring and fall have become the seasons of choice for calving, but tremendous differences exist as to what months within each of those seasons are the primary months for calving. Deciding on the use of one or two calving seasons is a big first step. Many fall calving seasons have arisen from elongated spring seasons. Two calving seasons fit best for herds with more than 80 cows. To take full advantage of the

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economies of scale, a ranch needs to produce at least 20 steer calves in a season to realize the price advantage associated with increased lot size. Therefore, having a minimum of 40 cows in each season is desirable.

Using two seasons instead of one can reduce bull costs a great deal. Properly developed and maintained bulls can be used in both the fall and the spring, therefore reducing the bulls needed by half.

Another small advantage to having two calving seasons is the capability of taking fall-born heifers and keeping them nonpregnant another few months to be bred in the spring season and vice versa. Thus, replacement heifers are 2.5 years old at first calving instead of 2 years old. These heifers should be more likely to breed early in the breeding season and have slightly less calving difficulty. Research has shown these differences to be small, so the cost of six months additional feed must be minimal to make this strategy pay.

Many producers like the dual calving seasons because of the spread of the marketing risk. Having half of the calf crop sold at two different times allows for some smoothing of the cattle cycle.

Two calving seasons require more time spent watching cows and heifers during calving. More pasture management and fencing may be needed to successfully have both a fall and spring calving season. The fall and spring herds must be maintained separately for most of the year because they are in different stages of production and have different nutritional requirements. In addition, breeding seasons will require fall calving cows be separate from spring calving cows during their respective breeding seasons.

Spring Calving Decisions

Producers who prefer spring calving systems still have choices. Early spring calving (February and March) has been utilized to a great extent in Oklahoma and north Texas. This time frame often puts calving during a wet, cold weather pattern. Weather stresses to baby calves can cause some direct weather-related death loss or scours that can be difficult to manage. Lactating cows require considerable energy and protein in February, March and April before spring grass is growing enough to supply all of the nutrients needed. The breeding season is initiated in April or May and continues through June. This comes at a time when weather stresses are minimal with the exception of the first blast of heat that occurs nearly every June.

Early spring calves are old enough to utilize forage by mid summer and weaning is in mid- to late October. During years with adequate summer pastures, calves should reach their genetic potential for weaning weight.

Some producers may consider moving their spring calving season to later in the spring or early summer. Research conducted in Nebraska has been studying the use of June as a target calving month (Sprott, Selk and Adams). They have been attempting to greatly reduce cow costs by making this change. Calving is carried out at a pleasant time of year, so weather stresses on the calves are reduced. Breeding is initiated in August and early September. Cows are wintered on sand hills range with very little added supplemental feed. Additional hay is given only in times of severe winter weather. The sub-irrigated meadows available in the sand hills are used for early spring grazing. The hope is that cows will regain enough body condition in spring to calve in adequate body condition by May. For cows to have adequate body condition going into the winter, the calves will be weaned in the fall at the usual dates, even though they are considerably younger. Results from this multi-year study suggest the program may be successful. Similar calving season changes are being tried by a few Kansas cow-calf operations. Some of these herds have been written about in the popular press. Consequently, Oklahoma and Texas producers are asking about the feasibility of changing to late spring and summer calving.

Hot Weather and Breeding Seasons

The first real concern to address with this potential change is the breeding season in late summer. Heat stress is rarely a problem for cows pastured in Nebraska. Although daytime temperatures can occasionally reach the century mark, nighttime temperatures often fall into the 60s F. Contrast those temperatures with typical summer weather in Oklahoma and Texas where temperatures can exceed 95 F with nighttime lows only dropping to near 80 F many days in a row. Many hours of the day can be quite hot and cause the slightest rise in body temperature of cattle. Research conducted at OSU illustrated the possible impact of heat stress of beef cows on their reproductive capability. In this experiment, the cows were bred naturally after synchronization, then exposed to mild or severe heat stress. The cows were stressed on day eight through day 16 after breeding (Table 34.1).

All of the cows were slaughtered on day 17 and the uterine contents were studied for the presence of an embryo. Note that only half of the cows undergoing severe heat stress had an embryo present and the conceptus, which is the embryo plus fluids and membranes, weighed half as much as did those from control cows. Severe heat stress shortly after breeding certainly had an adverse affect on embryo survivability and therefore, pregnancy rates.

Table 34.1. Effects of imposed heat stress on reproduction in beef cows.

	Control	*Mild stress*	*Severe stress*
Daytime temp (F)	71	97	98
Nighttime temp (F)	71	91	91
Relative hum. (%)	25	27	40
Rectal temp. (C)	38.9	39.3	39.8
Rectal temp. (F)	102.0	102.7	103.6
Pregnancy (%)	83	64	50
Conceptus[1] wt (g)	0.158	0.111	0.073

1 Embryo plus fluids and membranes.
Source: Biggers.

The Impact of Hot Weather on Bull Fertility

Several research trials have been conducted through the years on the effect of high temperatures on bull fertility. In 1963, researchers exposed bulls to temperatures of 104 F and 54% humidity for an eight-hour period and then allowed the temperature to drop to 82 F with 72% humidity for the remainder of the 24-hour period (Johnston, Naelapaa and Frye). This temperature regimen was continued for seven days and was designed to resemble natural conditions in the subtropics. They found the high temperatures resulted in detrimental effects on initial sperm motility, sperm concentration and total number of sperm per ejaculate.

More recently, Oklahoma scientists placed bulls in controlled environments of 95 F for eight hours and 87 F for the remaining 16 hours while similar bulls were placed in environments of constantly 73 F (Meyerhoeffer et al.). These treatments were applied to the bulls for eight weeks, then all bulls were exposed to the 73 F environment for another eight weeks. During the treatment, the heat-stressed bulls had rectal temperatures of 0.9 degrees higher than nonstressed bulls. The percentage of motile sperm cells decreased significantly in the bulls stressed by two weeks of heat stress (Figure 34.1).

Sperm motility did NOT return to normal values until eight weeks after the end of the heat stress. This explains some of the reduction in fertility often associated with summer and early fall breedings. The conclusion is that high ambient temperatures can result in detrimental effects on fertility on both the cow and the bull.

In 2001, Dr. L. R. Sprott of Texas A&M reviewed data from experiment stations in northern, mid-western and southern states. In the Montana and South Dakota (northern) data, spring and late-summer breeding seasons were similar in reproductive performance. In Kansas (mid-western), there was a substantial drop-off of first service conception rates for artificially bred cows from May to June and a further reduction in July. Illinois (mid-western) data showed a 14% greater pregnancy percentage for cows exposed to bulls in May and June, compared to cows exposed in July and August. The data for the southern states (Louisiana, Texas and New Mexico) produced the expected responses. Cattle exposed to breeding seasons in the high desert of New Mexico had excellent reproductive performance throughout the spring and summer months. Low nighttime temperatures and low humidities in the higher altitudes of New Mexico provide comfortable environments for reproducing cattle. However, spring and especially summer-month breeding seasons in Louisiana and Texas, where both heat and humidity are a problem, produced very low pregnancy rates especially July through September. In Oklahoma, late-spring and summer calving seasons that require breeding to start in late July and August will be impacted by heat and humidity and fertility can be expected to be reduced.

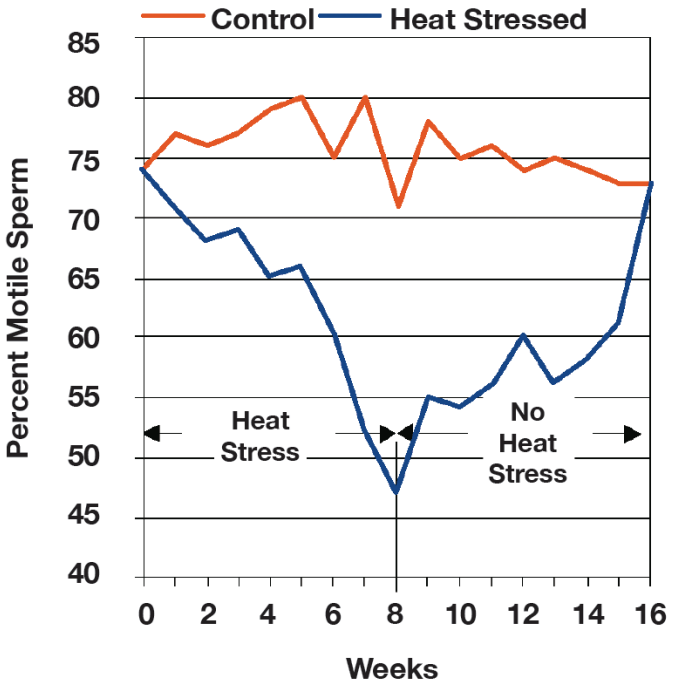

Figure 34.1. Percent motile sperm from bulls during and after heat stress. Source: Meyerhoeffer.

What to Do with Late Spring and Summer Calves

The next point of concern with late spring and summer calving is what to do with the calves. Leaving them to nurse the cow until they are seven months old is self-defeating, as the cows would become extremely thin or need considerably more feed to nurse in the dead of winter. Therefore, calves should be weaned in this scheme in early fall, at about 120 days of age. The Nebraska program has calves winter on alfalfa hay, supplemental grain and subirrigated meadows, then be available for sale as summer pastures are beginning to grow. Also, they are examining retained ownership options through summer grazing and/or the feedlot. The expense to feed the calves in the winter will offset some of the advantage gained in reduced feed for the cows. Small grain pastures may provide a source of feed for these lightweight calves in Oklahoma and northern Texas. This is a program that will be examined more closely in the fall calving section.

Another key issue is the body condition of the cows at calving time if they have been roughed through the winter and growth of spring grasses is late in spring (chapter 20). Thin cows at calving time provide less and poorer colostrum for early health of the calves, but more importantly, these cows return to heat very slowly, may be calving later in subsequent years, or may be open at pregnancy checking time.

The Nebraska Sandhill research merits consideration in those regions where expected climatic conditions during breeding will not be detrimental to reproductive performance. The issue of heat stress in July, August and early September suggests that caution should be taken before changing the calving season to late spring or early summer in other regions.

Fall Calving

The advantages and disadvantages of fall calving have been discussed in Oklahoma since the introduction of perennial cool season grasses such as fescue. Many producers who live in central or western parts of the state have only warm-season pastures, which include native and Bermudagrass, available to them. It often is thought that fall calving is only for those who live close to Arkansas or Missouri. Ranchers with only warm-season grasses might be surprised at the comparative advantages of fall calving. Fall calving programs are now being tried to a very limited extent in Wyoming, Nebraska and the Dakotas. Producers in those states are becoming aware of the strengths of a fall-calving program.

Producing a weaned calf ready to go onto lush spring and early summer grass has its appeal. Examining the 10-year average percentage change in beef cattle prices shows the fall-born calf can be in strong demand in the spring and early summer. Figure 34.2 illustrates the average percentage change in prices for 400- to 500-pound steer calves and 700- to 800-pound feeder steers in Oklahoma City. The slaughter cattle price changes represent the averages for Oklahoma-Texas Panhandle feedlots. The midpoint of the graph (100) represents the yearly average. Therefore, you can predict that 400- to 500-pound steer calves will bring 3% to 4% more than the yearly average in March and April. Likewise, producers can expect calves to be 2% to 4% less than the yearly average if marketed in the fall (October and November). It is no mystery that the price dips at the normal weaning time for the glut of calves sold in the October to November time frame.

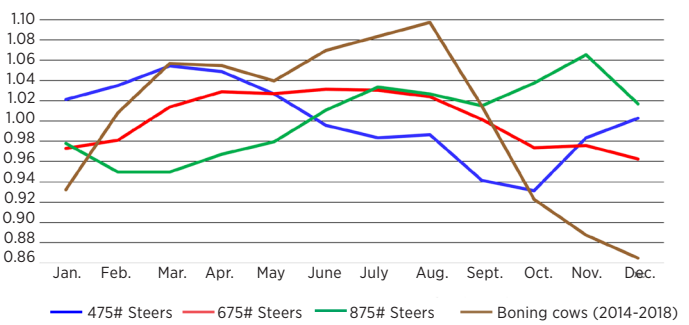

Figure 34.2. Ten-year average price percentage change in steers. Source: Jones.

Operations that calve in September and October enjoy excellent reproductive performance from the cows. The body condition of cows after summer pastures should be excellent. These cattle return to heat more quickly than do the thinner spring-calving cows and the breeding season in late November and December is usually completed in moderate weather. Often, the producers who dislike fall calving have tried to calve in October and November (often after wheat planting is complete). This puts the breeding season well into the harsher winter months and can cause some decrease in the pregnancy percentage. An added bonus to fall calving is that fall-born calves are lighter in average birth weight than are genetically similar spring-born calves. A lower incidence of dystocia also aids in the return to estrus and partially helps explain the routinely high reproductive rates of fall-calving cows.

Producers who winter cows on native range often believe it is too costly to have fall calvers because of feeding a lactating cow all winter. However, the Upper Midwest producers are finding fall calving does not have to be more expensive. The trick is to reduce expensive feed inputs after the breeding season is done. This will get the pregnant fall-calving cow through the winter healthy enough to regain body condition during the summer months after the calf has been weaned. Table 34.2 is a comparison of a typical range supplementation program for spring and fall cows. The amounts of supplement shown are the daily per head feed supplied during each respective month. The dollar figure is the number of days in the month multiplied by the amount fed and the price of supplement fed each day. These cows are considered to be moderate in frame size and milk production. The price used for cottonseed meal (CSM) is $343 per ton and for 20% range cubes is $250 per ton.

The supplementation program for fall-calving cows requires adequate forage to be available. Standing forage in the fall and early winter will be adequate to maintain body condition with the supplemental protein. In late winter and

Table 34.2. Common supplementation strategies for cows grazing native warm-season forage[a] during winter.

Month	*Spring calving cows*		*Fall calving cows*	
	Good cow condition and/or moderate weather	*Marginal cow condition and/or severe weather*	*Good to moderate cow condition and/or moderate weather*	*Thin cow condition and/or severe weather*
October	None	1 lb HP	2 lb HP	3 lb HP
November	1 lb HP[b]	2 lb HP	3 lb HP	4 lb HP
December	2 lb HP	3 lb HP	4 lb HP	6 lb MHP[d]
January	3 lb HP	4 lb MP	6 lb MHP[d]	7 lb HP
February	3 lb HP	5 lb MP[c]	6 lb MHP[d]	7 lb HP
March	3 lb HP	6 lb MP	5 lb MHP[d]	6 lb HP
April	2 lb HP	4 lb MP	3 lb MHP[d]	3 lb HP

a Forage protein declines to a low of around 3% to 4% during mid winter.
b HP = high protein supplement, containing 35% to 40% protein, as fed basis.
c MP = moderate protein supplement, containing 20% protein, as fed basis.
d MHP = moderate-high protein supplement, containing 25% protein, as fed basis.

very early spring, the energy requirements of lactating spring calving cows are increased to the point that protein alone may not get the job done and 20% range cubes are necessary. They are not needed for fall-calving cows because fall-calving cows are in excellent body condition at calving time. They return to heat early in the fall breeding season. Most mature fall calvers will be rebred by the first of the year. These cows can stand some loss in body condition between the end of the breeding season and spring grass. Therefore, protein supplementation and hay in addition to standing forage will suffice. It should be expected fall-calving cows would consume 20% more forage than spring calvers.

Using the OSU Enterprise Budgets (Sahs and Doye, 2015), annual pasture, hay, protein supplement and mineral costs were recently estimated to be about $272 for a spring-calving system and $313 for a fall-calving system. While the forage and feed costs for the fall-calving system are expected to be greater, calves from mature cows are frequently weaned at 8 months to 9 months of age around the middle of July. This results in rapid calf gain during the early summer and an additional 100 pounds to 200 pounds of weaning weight. Calves from first-calf heifers and older cows should be weaned at 7 months of age or earlier because of the longer lactating period.

Calving Season Length

Research using 394 ranch observations from the Texas, Oklahoma and New Mexico SPA data set provides insight into the age-old argument about leaving the bull out or having a defined breeding season (Parker et al). A positive relationship was found between number of days of the breeding season and the cost per cwt. of calf weaned. Also they reported a negative relationship between number of days of the breeding season and pounds of calf weaned per cow per year. The data suggested that for each day the breeding season was lengthened, the annual cost of producing 100 pounds of weaned calf increased by 4.7 cents and pounds of calf weaned per cow per year decreased by 0.158 pound. The range of breeding seasons in the data set was 11 days to 365 days. The producer who leaves the bull out year-round (365 days) had $13.63 greater costs per cwt. of weaned calf than the producer who used a 75-day breeding season. That same producer sold 45.82 fewer pounds of calf per cow per year on the average than producers with a 75-day breeding season.

How to Start a Controlled Calving Season

In most herds on a year-round calving season, a natural calving concentration already exists. Nutrition is the major factor responsible for cows cycling and conceiving. Since pastures usually are at their peak of quality in spring and early summer, a natural concentration of calving may occur in late winter and spring. No system of getting on a controlled breeding program can completely eliminate the delaying of some cows from their current calving schedule. However, by taking advantage of the natural concentration in a herd, the problem can be minimized.

A simple way to convert a herd from year-round calving to a two-season system is to split the cow herd into two calving seasons. Cows that calve late for one season would be moved into the alternative season as "early calvers." Consequently, breeding for these early calving cows will be delayed so they should calve in sync with the rest of that group the following year.

For example, assuming a 60-day spring calving season (March and April) and a 60-day fall calving season (September and October) are desired, all cows calving from May 1 through October 31 would be moved to the fall-calving group. These cows would be exposed to bulls from about November 23 to about January 23. Cows calving from November 1 through April 30 would be moved to a spring-calving group and exposed to bulls from about May 23 to about July 22.

Controlled calving seasons require planning to ensure a pasture and/or dry lot area is available to maintain bulls away from cows and heifers.

Other Considerations

Producers are encouraged to evaluate and deploy their time, money and other resources in the most economically feasible fashion. For all the information presented in this chapter about planning your calving season, don't overlook the obvious: what time of year best fits your schedule? Cow-calf operations are often part of a larger farm and ranch enterprise; or in many cases, a secondary farm enterprise. With this in mind, consider if there is a "best" time of year, based on your schedule permitting more opportunity to check cows and young calves possibly needing assistance or treatment. In many operations, saving one or two calves makes the difference between a profitable cow-calf enterprise versus one that will not break even. This can be a challenge if calving when other parts of a farm and ranch operation are busy or other responsibilities occur when cows are calving.

Conclusion

No one calving and breeding season fits every operation. Larger herds in the southern plains should consider two calving seasons. The cost of savings on reduced bull inputs and older replacement heifers plus two marketing windows offers economic advantages. Additional labor during two calving seasons and timing of labor needed must be considered.

Producers with traditional spring-calving programs may consider switching to or adding fall calving. It need not be more costly. Fall calving can benefit from current higher seasonal market trends. Moving the spring-calving season to May and June should be studied closely in Oklahoma because of the potential rebreeding problems in very hot weather.

Before any change in breeding, calving and weaning seasons are made, consider the marketing plan first. Is there a willingness and ability to retain ownership to market

the product to its best advantage? Study Figure 34.2 on the seasonality of cattle prices before making a significant change.

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