EXTENSION

BEEF CATTLE RESEARCH UPDATE
Britt Hicks, Ph.D., PAS
Area Extension Livestock Specialist
Oklahoma Panhandle Research & Extension Center

November 2019

Effect of Calving period on Beef Cow Longevity and Lifetime Productivity in Western Canada

Longevity and lifetime productivity are important factors influencing profitability in a cow-calf operation. If a heifer calves earlier in the calving season (first 21-day period), they have more time to heal and resume cycling before the next breeding season commences in order to maintain a 365-day calving interval. The results of ongoing study conducted at the University of Saskatchewan in western Canada clearly demonstrates the importance of early conception in beef heifers.[1] The objective of this study was to investigate the influence of calving early on lifetime reproductive performance and productivity.

Data from the Western Beef Development Centre's (WBDC; Saskatchewan, Canada) for a spring calving herd collected between 2001 and 2017 was used for this study. The breeding season at WBDC began approximately June 20 each year and lasted for ~65 days. Weaning occurred each year in late October (at ~160 days of age). Females sold or culled for non-breeding reasons (e.g., mothering, milk, conformation, temperament) were removed from the data set. Heifers were also eliminated from the data set if proper assignment to an initial calving group was not possible due to abortion, or birth of an abnormal or premature calf. The final data set for this study consisted of 211 Black Angus and Angus crossbred heifers born from 1999 to 2008. For analysis, two-year-old first-calf heifers were assigned to one of three 21-day calving periods based on the date their first calf was born. Each subsequent calf born to the cow was also assigned to a calving group (or period), but for analysis purposes the female remained in the group number assigned for her first parturition.

These researchers reported that heifers that calved with their first calf during the first 21-day period of the calving season remained in the herd longer (greater longevity) as compared with heifers that calved in the second 21-day period, or later. Figure 1 depicts percentages of cows remaining in the herd over time out to the ninth calving based on retention data. The retaining percentage of period 1 cows was 6.5 -18.3% and 2.9 -24.1% units greater than those of period 2 and period 3 cows, respectively.

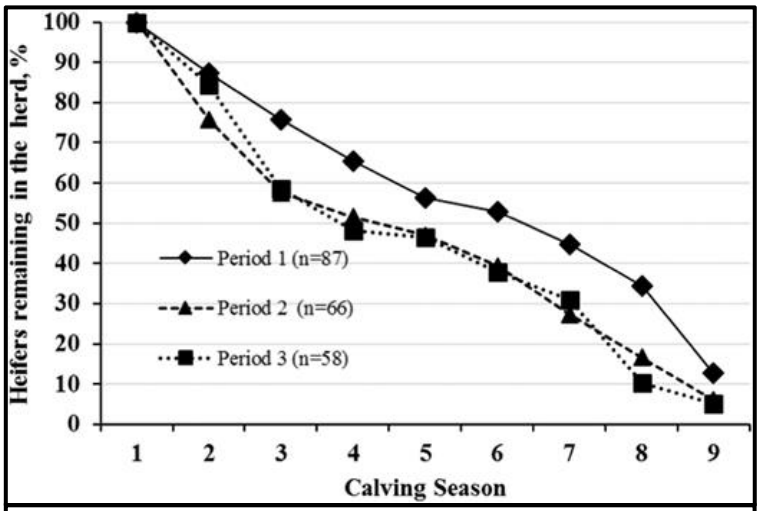

Figure 1. Analysis of the influence of calving period on herd survival. Period 1 = calved in the first 21 days; Period 2 = calved in the second 21 days; Period 3 = calved in the third 21 days and after as heifer.
Source: Damiran et al.. 2018.

These results agree with the previous findings on 16,549 individual heifers at the U.S. Meat Animal Research Center (USMARC, Figure 2).[2] In this study, analysis demonstrated that a significantly greater proportion ($P < 0.01$) of the heifers that calved in the first 21 days of their first calving season remained in the herd to produce a fifth calf.

In the Canadian study, heifers that had their first calf during the first 21-day period of the calving season had increased ($P < 0.05$) longevity compared with heifers that calved in the second and third 21-day periods (7.2, 6.5, and 6.2 years for period 1, period 2, and period 3, respectively). However,

no difference (P > 0.05) was observed between period 2 and period 3 groups in longevity. Average longevity in the USMARC heifers that calved in the first, second, or third period was 8.2, 7.6, and 7.2 years, respectively.

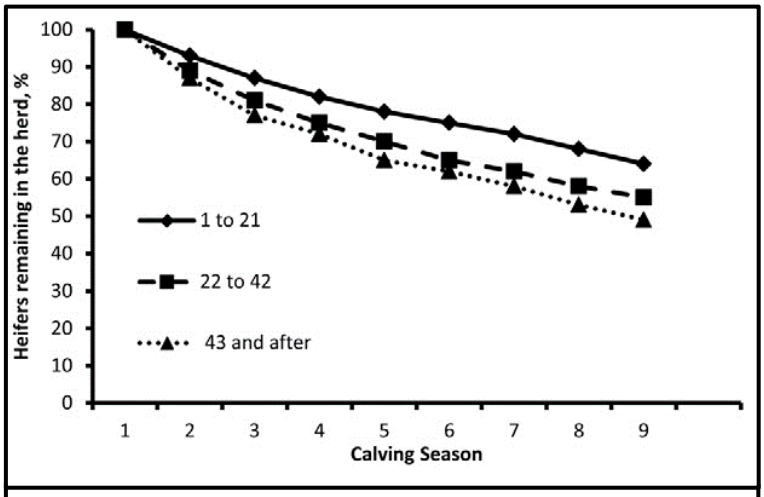

Figure 2. Analysis of the influence of calving period on herd survival from U.S. Meat Animal Research Center. Source: Cushman et al., 2013.

The effects of first calving period on a beef cow's lifetime productivity in the Canadian study are presented in Table 1. When production data for each year were pooled, cow groups were different from each other (P < 0.05) in calving date: 107, 110, and 119 days for period 1, period 2, and period 3 cows, respectively. These results indicate that the females that calved early as heifers tended to calve earlier throughout the remainder of their productive lives than the females that calved later in their first calving.

Table 1. Effect of first calving period on beef cow lifetime productivity.

	Calving Period			
Item	Period 1	Period 2	Period 3	P-value
Age at first calving, d	731[a]	751[b]	778[c]	<0.01
Calving interval, days	376[a]	372[a]	358[b]	<0.01
Calf birth date, Julian day	107[b]	110[b]	119[a]	<0.01
Calf age at weaning, Julian day	167[a]	164[a]	149[b]	<0.01
Calf weaning BW, lb	481[a]	478[a]	445[b]	<0.01
Calf adjusted 205-days weaning BW, lb/cow	582[a]	582[a]	562[b]	<0.02
Calf cumulative weaning BW, lb/cow	2551[a]	2088[ab]	1854[b]	0.04
Calf cumulative adjusted 205-day weaning BW, lb/cow	3089[a]	2549[ab]	2346[b]	0.03
Total produced calves, #/cow	5.4[a]	4.5[b]	4.2[b]	0.03
Weaned calves revenue, $/cow	4,251[a]	3,478[ab]	3,091[b]	0.01

[abc]Means without a common superscript differ (P ≤ 0.05).
Adapted from Damiran et al., 2018.

When lifetime productivity for each animal was pooled, calf actual average weaning body weight (BW) and average adjusted 205-day weaning BW were 33 lb heavier (P < 0.01) and 20 lb heavier (P < 0.01), respectively, for period 1 and 2 cows compared to period 3 cows. The average number of lifetime calves weaned for cows that calved in the first, second, and third 21-day periods was 5.4, 4.5, and 4.2 per cow, respectively. Due to the combined effects of greater average number of calves weaned over lifetime and actual calf weaning BW, cows that had their first calf during the first 21-day period had (P < 0.01) greater total weight weaned (2551 lb) compared with heifers that calved in the second (2088 lb) or third (1854 lb) 21-day period. As a result, period 1 cows generated an additional $773 to $1160 in weaned calf revenues over their lifetime compared to period 2 or 3 cows.

Similar results were observed in the USMARC data. In this data, the weaning BW of the first 6 calves born to heifers that calved in the first calving period of their first calving season was greater than those of heifers that calved in the second or third period of their first calving season (P < 0.05). Furthermore, calving period influenced the total pounds weaned and average weaning weight (P < 0.01), with heifers that calved during the first period having increased weaning weights, total pounds weaned, and average weaning weights compared with heifers calving in the second or later period.

Similarly, heifers calving during the second period had increased weaning weights, total pounds weaned, and average weaning weights compared with heifers calving later.

In conclusion, the results of this Canadian study and the USMARC study clearly demonstrate that heifers that calved early in their first calving season had increased longevity and weaned more calves, compared with heifers that calved later in the calving season. Moreover, in their lifetime, heifers that calved during the first 21-day period of their first calving season weaned approximately one more calf compared with heifers that calved later in the calving season. Therefore, developing heifers so that they conceive early in the breeding season and subsequently calve early in the calving season is critical for heifer longevity in the herd as well as the performance of her progeny in subsequent generations.

---

[1] Damiran, D., K. A. Larson, L. T. Pearce, N. E. Erickson, and B. H. A. Lardner. 2018. Effect of calving period on beef cow longevity and lifetime productivity in western Canada. Transl. Anim. Sci. 2:S61-S65.

[2] Cushman, R. A., L. K. Kill, R. N. Funston, E. M. Mousel, and G. A. Perry. 2013. Heifer calving date positively influences calf weaning weights through six parturitions. J. Anim. Sci. 91:4486-4491.