BEEF CATTLE RESEARCH UPDATE

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Effect of Calving Distribution on Beef Cattle Progeny Performance

Researchers with the University of Nebraska used records from a spring calving cow herd at the Gudmundsen Sandhills Laboratory near Whitman, NE collected between 1997 and 2010 to determine the effect of calving period on subsequent heifer (1,019 head) and steer (771 head) progeny performance.[1] The progeny were classified as being born in the first, second, or third 21-day period of the calving season within each year.

The effect of calving period on heifer progeny performance is shown in Table 1. Heifer calves born in the first calving period were an average of 16 days older than those in the second period and 36 days older than those in the third period (P < 0.01). Heifer birth weight was lightest (P < 0.01) for heifers born in the first period. Birth to weaning average daily gain (ADG) tended (P = 0.10) to be least for heifers born in the first calving period; however, weaning weight decreased (P = 0.03) with advancing calving period (483, 470, and 434 lb, respectively, for first, second, and third 21-day period). Gains from weaning to pre-breeding tended (P = 0.07) to be least for heifers born in the first period; however, pre-breeding weight was greatest (P < 0.01) for calves born in the first period (653, 644, and 609 lb, respectively, for first, second, and third 21-day period).

Table 1. Effect of calving period on ADG, reproduction, and first calf characteristics of heifer progeny.

	Calving Period			
Item	1	2	3	P-value
# Calves	651	304	64	
Traits of heifers from birth to breeding				
Birth date, day of year	77[a]	93[b]	113[c]	< 0.01
Calf birth weight, lb	79[a]	82[b]	84[b]	< 0.01
Calf weaning weight, lb	483[a]	470[b]	434[c]	0.03
Pre-weaning ADG, lb	1.83	1.83	1.90	0.10
Pre-breeding ADG, lb	0.86	0.90	0.90	0.07
Traits of heifers from breeding to pre-calving				
Pre-breeding weight, lb	653[a]	644[b]	609[c]	< 0.01
Cycling beginning of breeding, %	70[a]	58[b]	39[c]	< 0.01
Breeding ADG, lb	1.59[a]	1.63[ab]	1.70[b]	0.03
Pregnancy diagnosis weight, lb	822[a]	818[a]	789[b]	< 0.01
45 day pregnancy rate, %	90[a]	86[a]	78[b]	0.02
Traits of heifers and progeny from pre-calving to weaning				
Pre-calving weight, lb	946	948	922	0.06
First calf birth date, day of year	68[a]	73[b]	75[b]	< 0.01
First calf birth weight, lb	79[a]	82[b]	84[b]	< 0.01
Calved in first 21 days, %	81[a]	69[b]	65[b]	< 0.01
Traits of progeny at weaning				
Calf weaning weight, lb	426	417	410	0.10
Pregnancy rate after first calf, %	93	90	84	0.20

[a,b,c]Means without a common superscript differ (P ≤ 0.05).
Adapted from Funston et al., 2012.

Heifer ADG from the beginning of the breeding season to pregnancy diagnosis was greater (P = 0.03) for heifers born in the third vs. first calving period (1.70 vs. 1.59 lb/day). The percentage of

heifers cycling at the beginning of the breeding season decreased (P < 0.01) with advancing calving date (70, 58, and 39%, respectively) and 45 day pregnancy rates were lowest (P = 0.02) for heifers born in the third calving period (90, 86, and 78%, respectively). Birth date of the first calf of the heifer and birth weight decreased (P < 0.01) if the heifer was born in the first calving period. In addition, more calves were born in the first calving period if the heifer herself was born in the first calving period as compared to later (81, 69, and 65%, respectively). First calf progeny tended (P ≤ 0.10) to have greater weaning weights if born to a heifer born in the first calving period (426, 417, 410 lb, respectively, for first, second, and third 21-day period).

The effect of calving period on steer progeny feedlot performance and carcass characteristics are shown in Table 2. Steer calves born in the first calving period were an average of 18 days older than those in the second period and 43 days older than those in the third period (P < 0.01). Steer calf weaning weight decreased (P < 0.01) as calving period advanced (525, 496, and 450 lb, respectively, for first, second, and third 21-day period). Calving period did not affect feedlot performance. However, final weight decreased (P < 0.01) as calving period advanced (1301, 1279, and 1239 lb, respectively, for first, second, and third 21-day period). In addition, as calving period advanced, carcass weight, marbling score, and yield grade decreased (P < 0.01). The percentage of steers grading USDA low choice or greater was not affected (P = 0.13) by calving period; however, the percentage of steers grading USDA average choice or greater and the total carcass value declined (P ≤ 0.01) as calving period advanced.

Table 2. Effect of calving period on feedlot performance and carcass characteristics of steer progeny.

	Calving Period			
Item	1	2	3	P-value
# Calves	431	287	53	
Traits of steers from birth to weaning				
Birth date, day of year	73[a]	91[b]	116[c]	< 0.01
Calf birth weight, lb	82[a]	84[b]	84[b]	0.03
Calf weaning weight, lb	525[a]	496[b]	450[c]	< 0.01
Pre-weaning ADG, lb	2.09	2.12	2.12	0.61
Traits of steers in feedlot				
Feedlot ADG, lb	3.62	3.62	3.66	0.81
Final weight, lb	1301[a]	1279[b]	1239[c]	< 0.01
Dry matter intake, lb	17.93	17.90	17.93	0.97
Gain:Feed	0.202	0.202	0.204	0.52
Steer carcass characteristics				
Hot carcass weight, lb	818[a]	805[b]	778[c]	< 0.01
Yield grade	3.0[a]	2.9[b]	2.7[b]	< 0.01
Marbling score[1]	569[a]	544[b]	519[b]	< 0.01
USDA Low Choice or greater, %	79	78	68	0.13
USDA Avg Choice or greater, %	34[a]	19[b]	14[b]	0.01
Carcass value, $	1,114	1,089	1,040	< 0.01

[a,b,c]Means without a common superscript differ (P ≤ 0.05).
[1]500 = small[0] marbling score, USDA low choice,
Adapted from Funston et al., 2012.

In summary, heifer calves born during the first 21 days of the spring calving season had greater weaning, pre-breeding, and pre-calving weights; greater percent cycling before breeding; and greater pregnancy rates compared with heifers born in the third period. In addition, heifers born during the first 21 days of the calving season also had their first calf earlier with greater weaning weights compared to heifers born in the third calving period. Steer calves born earlier in the calving season had greater weaning, final, and carcass weights and marbling scores. Due to greater

carcass weights and marbling scores, steers born earlier in the calving season yielded carcasses of greater value. These data clearly illustrate that the calving period of progeny significantly impacts subsequent performance. These researchers concluded that managing groups of heifer and steer progeny by calving date may allow for more efficient use of resources and optimize reproductive performance of heifer calves and feedlot performance of steer calves.

[1] Funston, R. N., J. A. Musgrave, T. L. Meyer, and D. M. Larson. 2012. Effect of calving distribution on beef cattle progeny performance. J. Anim. Sci. 90:5118-5121.