

Comparison of Pre-weaning Growth Traits for Early and Late Spring Calving

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SUMMARY

Results from a 5-year study to evaluate early (March) and late (May) Spring calving in Southwest Colorado indicate no affect on pre-weaning growth traits. Other factors such as age of dam, sex and age of calf had the usual impact on birth weight, weaning weight and weight per day of age, regardless of calving season. These results will allow us to more accurately evaluate reproductive and economic viability of the two calving seasons.

Key Words: Calving, Management, Season, Birth weight, Weaning Weight, WDA

INTRODUCTION

A five year study was undertaken at the San Juan Basin Research Center to evaluate growth and reproductive traits as well as the economic viability of two different calving seasons. The traditional time of calving in Colorado occurs during the months of March and April (Whittier et al., 2000). Interest has existed in recent years, as to the viability of calving cows and heifers at a later time period in the spring or early summer, in an effort to more closely match cow nutrient requirements with forage nutrient content.

Additionally, producers are concerned about the growth and reproductive performance of cows and heifers bred to calve at a later period of late spring and/or

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early summer. Studies conducted in other states (Clark et. al., 1997, Pruitt et al, 2000) indicate some advantages and some disadvantages to calving later than the traditional March and April time period. This paper discusses the comparison of pre-weaning growth traits between early and late spring calving.

MATERIALS AND METHODS

Cattle Description and Treatment Management

Data were collected from 2002 until 2005 at the San Juan Basin Research Center (SJBRC) in Hesperus, CO. The cow herd is primarily Red Angus commercial cows that were bred to Red Angus sires during the study. Prior to the 2001 breeding seasons, the 300 head cow herd was divided into two calving groups. Group 1 calved in March and April while Group 2 calved in May and June. Cows were distributed evenly to both groups based on age and post-partum interval.

For each calving season, heifers were managed to calve two-weeks prior to cows.

Approximately 40 replacement heifers were integrated yearly into each group. Females were culled on pregnancy and production level. Cow numbers in each group were initially 160 head. However, due to the drought conditions in 2002, numbers were decreased to 120 for the 2003 calving season. As conditions have improved, cow numbers have returned to 160 per calving group.

The 2006 calving season is currently under way and additional data will be collected.

Statistical Analysis

The General Linear Models analysis of variances procedure of SAS (1996) was used in the analysis of independent variables which included calving group (1-early, 2-late), sex , birth year, birth month, and grouped age of dam (2,

3, 4, 5-9 and 10+). Age was also included as a regression coefficient. Of 1063 animals born, 857 were used in the analyses. Least squares means (LSM) were taken from this analysis. Traits analyzed included birth weight (BW), actual weaning weight (WW), weight per day of age at weaning (WDA) and adjusted 205 day weaning weight (AWW).

RESULTS

Table 1 shows the previous four year's averages for the traits analyzed during the study. Prior to this calving study, the average birth date was March 28th each year. The calculated averages were 85 lbs for BW, 468 lbs for WW, 2.52 lb/day for WDA and 535 lbs for AWW. Calves were weaned at approximately 189 days of age.

Impact of Calving Group on Pre-weaning Growth traits

Table 2 summarizes the raw data from the two calving groups. Calves born in Early Spring had an average birth date of March 26th and were weaned at approximately 190 days of age. Late Spring calves had an average birth date of May 23rd and were weaned at approximately 192 days of age.

Least square means for calving group are shown in Table 3. There were no significant differences between Early Spring and Late Spring Calves for any of the pre-weaning traits. Figure 1 illustrates the small differences between the original calving season, and then the early spring and late spring seasons. These results will be important in the economic analysis of this study when we compare feed and labor costs associated with each calving season.

Impact of Age of Dam on Pre-weaning Growth traits

Age of dam (AOD) significantly affected all of the pre-weaning growth traits. Data found

in Table 3 show the typical age of dam trends expected in pre-weaning traits. Calves out of two-year olds tended to be lighter at birth and slower growing to weaning. As expected, calves out of the 5-9 year old dams have the highest WDA. Figure 2 illustrates the steady increase of WW from 2-yr to the 5-9 yr category, followed by the expected decrease in WW in the 10+ cows. The differences were smaller for AWW as it has been adjusted for AOD, sex and age of calf.

However, results indicate that the Beef Improvement Federation (BIF) standard adjustment factors for AOD may not be appropriate for the heifers at the SJBRC. All other age class adjustments appear accurate.

Impact of Sex of calf on Pre-weaning Growth traits

Sex of calf significantly affected all of the pre-weaning growth traits. LSM in Table 3 show that male calves were 6 pounds heavier at birth and grow faster (.09 pounds per day) from birth to weaning.

Impact of Birth Year on Pre-weaning Growth traits

Birth year of calf also significantly affected all of the pre-weaning growth traits as shown in Table 3. Calves born during the drought of 2002 were weaned early (147-d and 153-d, respectively for early and late spring), therefore their weaning weights were much lower than other years. Weaning weights from 2002 were 96 pounds lighter than 2003 and 201 pounds lighter than the peak year of 2004. Figure 3 shows the birth weights for all 4 years were similar, and data from 2003, 2004 and 2005 were very similar for pre-weaning growth traits.

Impact of Birth Month on Pre-weaning Growth traits

Birth month of calf significantly affected all of the pre-

weaning growth traits. LSM in Table 3 show that calves born during the colder months of Feb and March had heavier birth and weaning weights. Calves born during May, June and July were lighter at birth and had the lowest weaning weights. Interestingly, the WDA for calves born in June was highest at 2.92 lb/day while it was lowest for May and July-born calves. Those calves born when the grass was growing the fastest had higher weight per day of age.

Impact of Age on Pre-weaning Growth traits

Age of calf at weaning had a significant affect on WW, WDA and AWW as shown in Table 3. For each additional day of age, the calf weighed 1.34 pounds more while its' WDA decreased by .0075 lb.

DISCUSSION

The results of the study indicate that calving group had no significant impacts on any of the pre-weaning growth traits evaluated in this study. The lack of differences in growth traits will become important as we conduct an economic analysis of the calving groups and compare feed and labor costs associated with the two calving groups.

Other factors (age of dam, sex of calf and age of calf) that can impact growth traits demonstrated the typical effects on the various traits measure. As would be expected, calves out of 5-9 year old cows had the highest weight per day of age, male calves were heavier at birth and grew faster from birth to weaning, older calves weighed more at weaning. The impact of the drought year (2002) was as expected with calves born in that year lighter at weaning than for other years.

Interestingly, the data indicate that calves born during the month of June had the highest weight per

day of age (2.92 lb/day). Forage production at this location is at its peak during the month of June and would contain the highest level of nutrients compared to other months of the year.

The results of the project indicate that growth traits were not significantly impact by timing of the calving season. Other factors that normally impact growth traits did in fact cause differences to exist on the growth traits measure. However, these factors impacted the growth traits regardless of the calving season.

IMPLICATIONS

Results of a 5 year calving season study comparing the impact of calving in the traditional March/April time frame compared to a later May/June time frame had no significant effect on pre-weaning growth traits. Other factors such as age of dam, sex of calf and age of calf had the usual impact on birth weights, weaning weight and weight per day of age. Birth year and birth month were important on some of the traits. These factors were important regardless of calving season.

LITERATURE CITED

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Table 3. Least Squares Means and Regression Coefficients for Pre-weaning Traits by Calving Group, AOD, Sex, Birth Year , Birth Month and bAge

	BW (lbs)	WW (lbs)	WDA (lb/day)	AWW (lbs)
Calving Group				
1-Early	81	471	2.41	510
2-Late	79	476	2.48	528
Age of Dam				
	**	**	**	**
2	75	430	2.23	506
3	80	470	2.43	530
4	81	485	2.51	527
5 to 9	82	502	2.59	525
10 +	83	480	2.47	507
Sex				
	**	**	**	**
Female	77	464	2.40	509
Male	83	483	2.49	529
Birth Year				
	**	**	**	**
2002	80	391	1.97	420
2003	79	495	2.57	546
2004	84	592	2.55	542
2005	77	515	2.68	569
Birth Month				
	**	**	**	**
Feb	86	528	2.76	583
March	88	507	2.62	557
April	83	474	2.46	521
May	78	450	2.31	488
June	76	450	2.92	488
July	69	431	2.23	477
Age (per day)				
	-0.047	1.34	-0.0075	-1.04

** P < .01; * P < .05

Y= Calving Group+ AOD + SEX + BirthYear + BirthMonth + bAge

Figure 1. Calving Season Comparisons

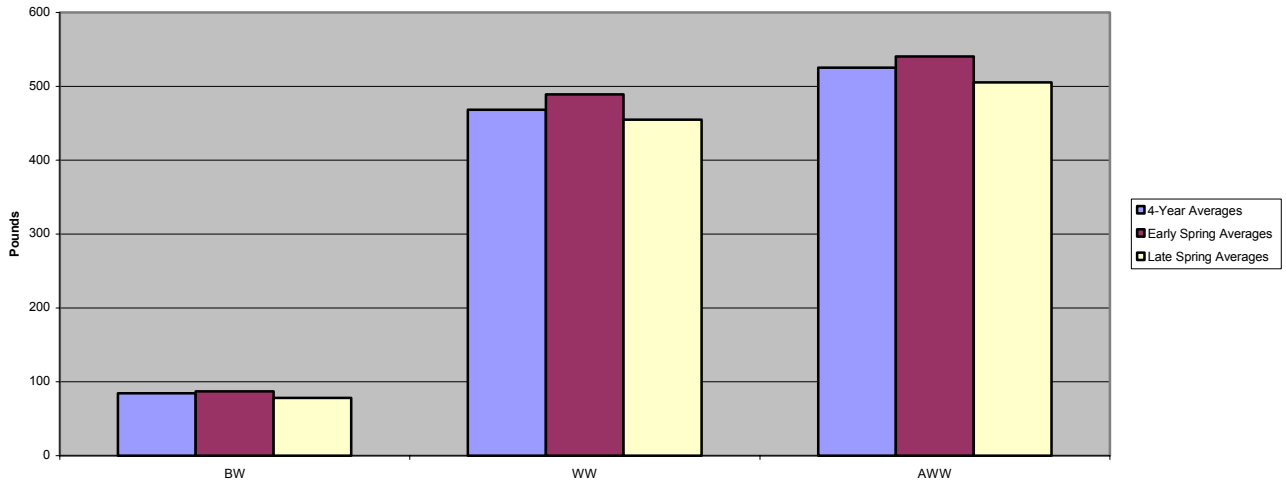


Figure 2. Age of Dam Differences for Pre-Weaning Traits

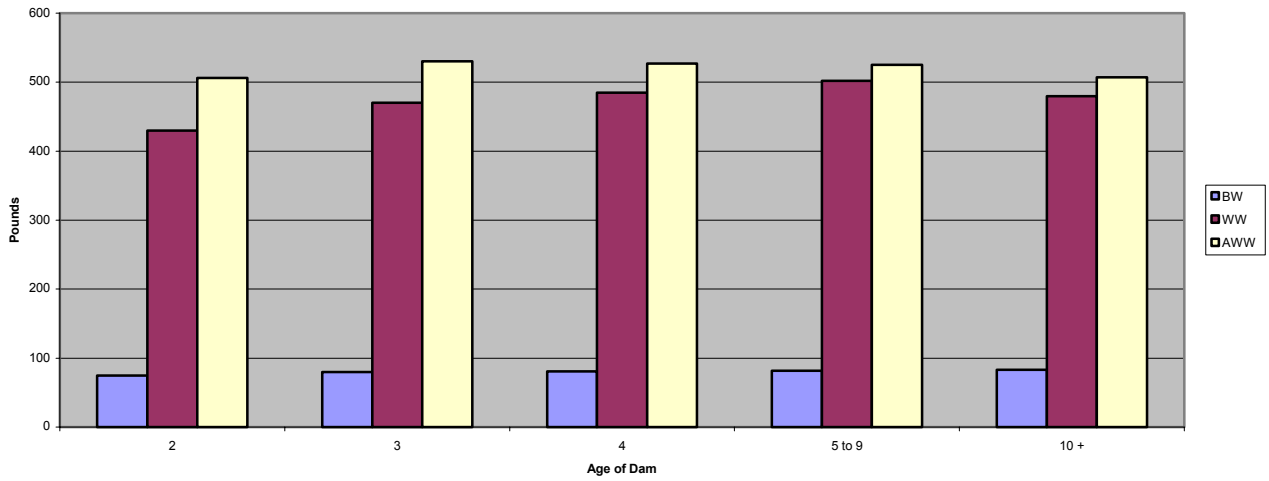


Figure 3. Birth Year Differences in Pre-Weaning Traits

