



Western Beef Development Centre

Division of PAMI

EFFECTS OF TWO CALVING SYSTEMS ON COW AND CALF PERFORMANCE IN WESTERN CANADA

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Introduction

The traditional calving season in western Canada is primarily late winter to early spring, or January to March. Historically strong prices and fall demand for calves have encouraged cow-calf producers to calve early in the year and raise a heavier calf to market. Today, however, with changing market conditions and increased costs of production, many cattle producers are evaluating different calving systems. Alternatives must be sought to reduce costs for the cow-calf enterprise. One alternative suggests that the calving season should coincide with peak pasture production and forage quality, to coincide with the nutritional requirement demands of the lactating cow (Adams et al. 1994; Adams et al. 1996; Deutscher et al. 1991; Grings et al. 2008; Kruse et al. 2004; Pang et al. 1998; Reisenauer et al. 2001). No differences ($P>0.05$) were reported in reproductive efficiency measures, such as pregnancy rate, calving rate, or assistance and weaning rate between beef cows calving in early (March-April) or late (May-June) calving systems, even though pre-weaning calf growth rate was lower ($P>0.05$) for late-borne calves (Grings et al. 2008; Kruse et al. 2004). There has been some calving systems research carried out in the United States and Eastern Canada (Grings et al. 2008; Stonehouse et al. 2003), but only limited research in western Canada (Pang et al. 1998).

The objective of this study was to evaluate the effects of early (March) and late (June) calving systems on cow performance and calf birth weight, calf weaning weight, and calf growth rate in western Canada.

Trial Management

A two-year study was conducted to evaluate the effects of early (March) (EC) vs late (June) (LC) calving under traditional and non-traditional conditions at three different locations in western Canada; (i) Agriculture and Agri-Food Canada (AAFC) - Brandon Research Centre, Brandon MB; (ii) AAFC - Semiarid Prairie Agricultural Research Centre, Swift Current SK ; (iii) and Western Beef Development Centre, Lanigan SK.

Total cows allocated to each calving system (EC, LC) at each location was, 120 cows at Brandon MB, 60 cows at Swift Current SK, and 100 cows at Lanigan SK. All calves were weaned at approximately 205 days of age in each calving system. Calves born in the EC system were weaned the middle of October each year, and calves born in the LC system were weaned early in January each year.

Feeding Management

Four different feeding systems were used to manage the cow herd throughout the calendar year. Feeding systems were managed to ensure that adequate quantity and quality of feed was available to match the cows' nutrient requirements (NRC 1996), depending on condition and pregnancy status. The average number of days cows were managed in each



feeding system was dependant on availability of forage and differed at each location (Table 1). At Swift Current SK, pastures were composed primarily of native forages, whereas at Brandon MB and Lanigan SK, pasture composition consisted mainly of tame, seeded forages. During fall and winter at all locations, cows were managed on both swath grazing and bale grazing systems. Annual crops used for swath grazing included oats, red proso millet and Ranger barley. Grass-legume bales were used for bale grazing throughout the winter months. During extended periods of extreme cold winter conditions, cow-calf pairs (LC) were supplemented with rolled barley for extra energy. Cows managed in LC system spent 45% more days on extended grazing systems and 60% fewer days managed in drylot pens compared to cows managed in the EC system (Table 1).

Table 1. Average days cows managed each feeding system^z

Item	Calving system	
	Early Calving	Late Calving
Pasture grazing	121	129
Swath grazing	121	129
Bale grazing	60	131
Drylot pen feeding	135	56

^zAverage days in each feeding system at 3 locations over 2 years

Average crude protein content of feeds and recommended beef cow requirements (NRC 1996) are presented in Figure 1. Feed and forage quality based on crude protein (CP) content appeared adequate to meet a lactating cow's (20 kg milk production) nutrient requirements according to NRC (1996) requirements. Assuming that most beef cows do not reach 20 kg of milk production following calving, CP requirements were generally met during lactation in both the EC and LC systems (Figure 1).

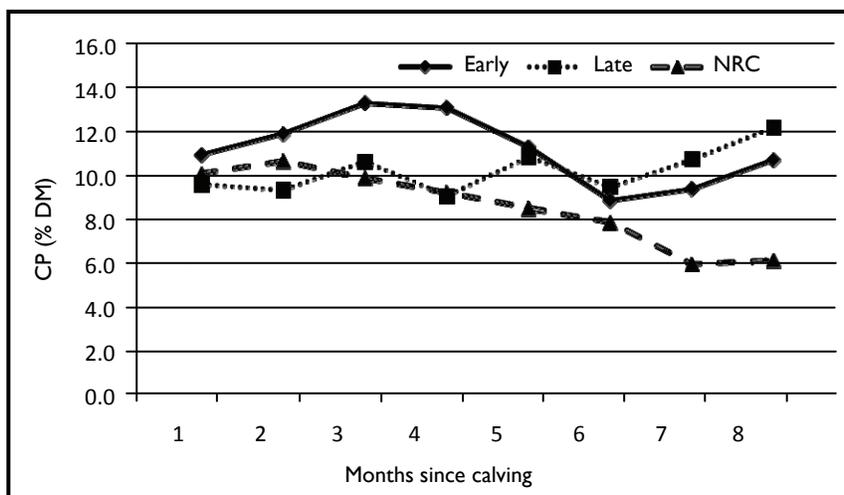


Figure 1. Average feed crude protein in early and late calving systems

Cow and Calf Performance

All cows were weighed and body condition scored (BCS) using the Scottish system, where 1=emaciated and 5=grossly fat (Lowman et al. 1976), prior to each management phase (pre-calving, pre-breeding and pre-weaning). Over the two-year study, cow body weight change was similar from calving to breeding (early lactation) for cows in either calving system (Table 2). The management period following calving (breeding to weaning) is the most demanding time for the cow, and producers should ensure proper feeding management and allocation of necessary nutrients. In this study, cow performance was not greatly affected as nutrient requirements were met during each



phase. From breeding to weaning, cows in the early calving (EC) system gained less weight than cows in the late calving (LC) system. Late-calving (May-June) cows grazing late-summer and early-fall pastures gained 75 pounds more body weight than cows calving in the traditional spring (EC) system (Table 2). This would suggest a less severe environment for summer-calving cows to gain weight and condition than spring-calving cows. This may also suggest feed nutrients consumed by EC cows were allocated solely for lactation and maintenance needs with no extra for storage. This can be an indication of a less stressful calving system on the cows, although this was not evident when looking at body condition (Table 2).

Table 2. Change in cow body weight^z and body condition from calving to weaning

		Early Calving			Late Calving		
		BR	SC	LA	BR	SC	LA
Change in Body Weight (lb)	Calving to breeding ^y	4	6	8	3	4	7
	Breeding to weaning ^x	26	21	33	102	103	107
Change in Body Condition (BCS)	Calving to breeding	0.1	-1.4	-0.2	-0.6	0.2	0.01
	Breeding to weaning	-0.2	0.07	0.2	-0.3	-0.1	-0.3

^zbody weights adjusted for conceptus growth

^yperiod length = 60 days

^xperiod length = 150 days

Body condition score (Table 2), was minimally affected with little difference observed between cows in either calving system. Body condition score is a good indicator of body fat reserves which play a large role in cow reproductive performance. No effect was observed on cow reproductive performance between calving systems. Total pounds of calf weaned per cow exposed were much lower for cows in the late calving system (Table 3).

Table 3. Pounds of calf weaned per cow exposed in two calving systems^z (lb)

	Early calving	Late calving	Difference
Brandon MB	598	509	89
Swift Current SK	548	471	77
Lanigan SK	524	434	89

^zAverage of two years

This resulted in an average of 85 pounds less calf produced per cow between calving systems (Table 3). This difference may be a result of the harsher winter environment for the late-born calf, which is weaned at the end of December, suggesting more energy nutrients are allocated for maintenance instead of growth.

Conclusions

The effects of two calving systems at three locations were evaluated in different environments in western Canada. Averaged across all locations, cows LC gained more body weight from breeding to weaning than cows EC. There was a difference in total pounds weaned per cow exposed but the differences were minimal when considered on a per-calf basis. The feed quality was adequate to meet cow requirements in both calving systems and resulted in no difference in cow reproductive performance. Finally, LC cows in the late calving system were managed in extended grazing systems for a longer period than those in the EC system without compromising performance. This would suggest a savings in feed cost per cow per day.



Acknowledgements

Appreciation is given to the following organizations for financial support: Agriculture and Agri-Food Matching Investment Initiative, Viterra-Proven Seeds, Saskatchewan Cattle Marketing Deductions Fund, Saskatchewan Horned Cattle Purchases Fund, Saskatchewan Agriculture Development Fund, and Southwest Forage Association.

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