

The Impact of Calving Distribution on Weaning Weights in Spring and Fall Calving Herds

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Hypothesis and Educational Need

Calves born in the first 21 days of either the spring or fall calving season will be heavier at weaning. There is a need to share calving distribution findings with producers to improve calf crop value.

Introduction

Calving distribution is defined as the number of females calving within 21-day periods of the calving season. Previous research has indicated that older calves weigh more at weaning. This study evaluated data from the Shenandoah Valley Agricultural Research and Extension Center (AREC)/McCormick Farm herd for the years 2000-2013 (spring calving) and 2014-2023 (fall calving) to determine differences in calving distribution and weaning weights of calves born in different 21-day periods of the calving season.

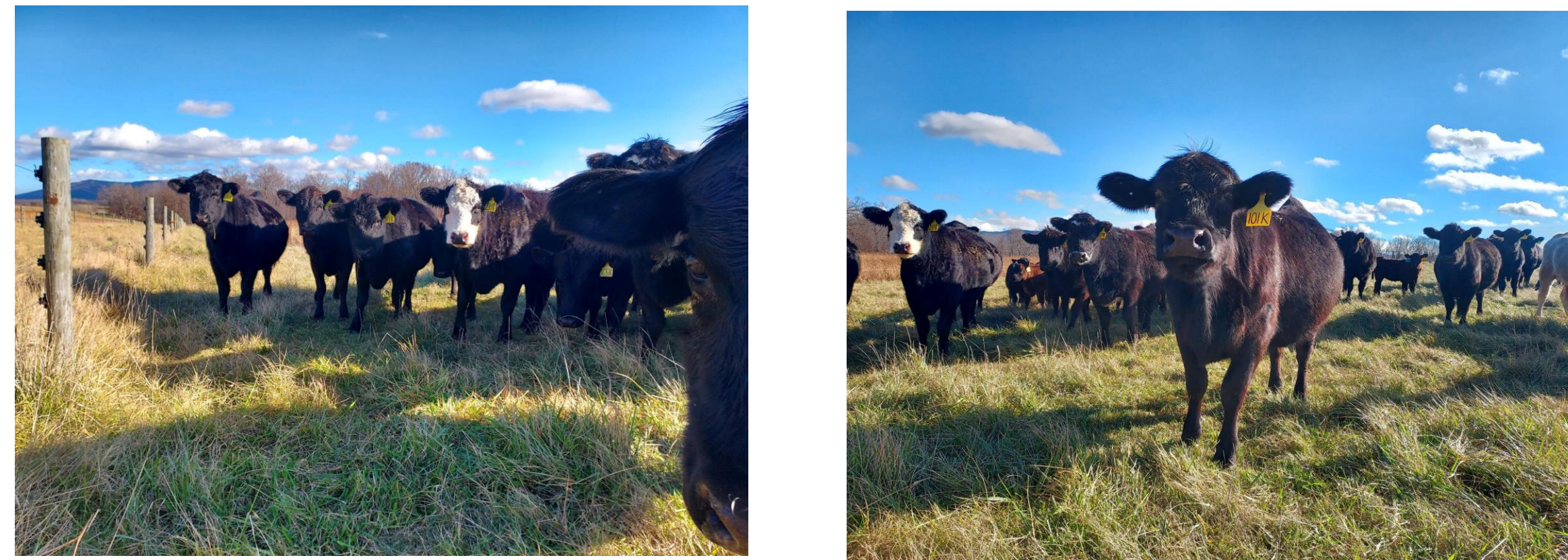


Figure 1 & 2 – Fall First Calf Heifers grazing stockpiled grass.

Materials and Methods

From 1999-2013 the center operated as a spring calving herd with calves born January to April. In 2013, the herd transitioned to fall calving with the calving season August to November. First Calf Heifers and Cows were grouped separately into 21-day calving periods to analyze percent calving and weaning weights. Weaning weight data was found to follow a normal distribution using a Q-Q plot and histogram. Spring and fall body condition, birth weight, weaning weight, weight per day of age and average daily gain were compared. Performance data was analyzed using Microsoft Excel® Analysis of Variance (ANOVA) to determine statistical differences at $p > 0.05$.

Results

A total of 3,742 calves were in this study; 465 to spring calving first calf heifers, 1,607 to spring calving mature cows; 285 to fall calving first calf heifers, 1385 to fall calving mature cows. Calves born in the first 21 days of the calving season weighed more than calves born in the second and third 21 days of the calving season ($p > 0.000005$) for both spring and fall calving seasons.

Table 1. Cow BCS at Pre-breeding, preg check and calf birth WT, Age, Weight per day of age (WDA), Weight at weaning (WW)

Calving Season	BCS pre-brd	BCS pg chk	Age (Days)	BW (lb)	WDA (lb)	Avg WW (lb)
Spring Calving	5.4	5.7	195	79	2.45	475
Fall Calving	5.5	5.0	214	69	2.16	459

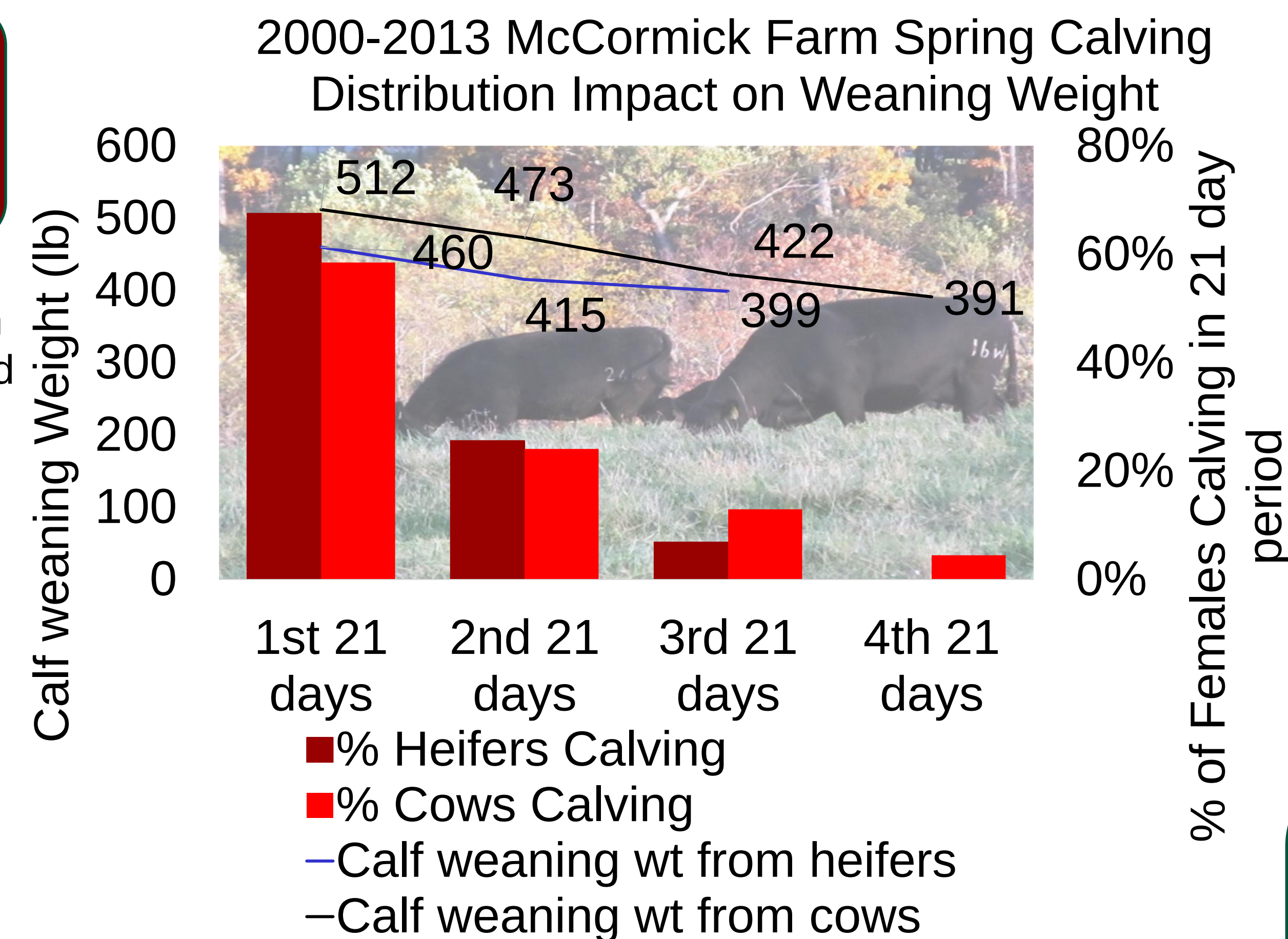


Figure 3 – Calving Distribution Spring Calving Seasons 2000-2013

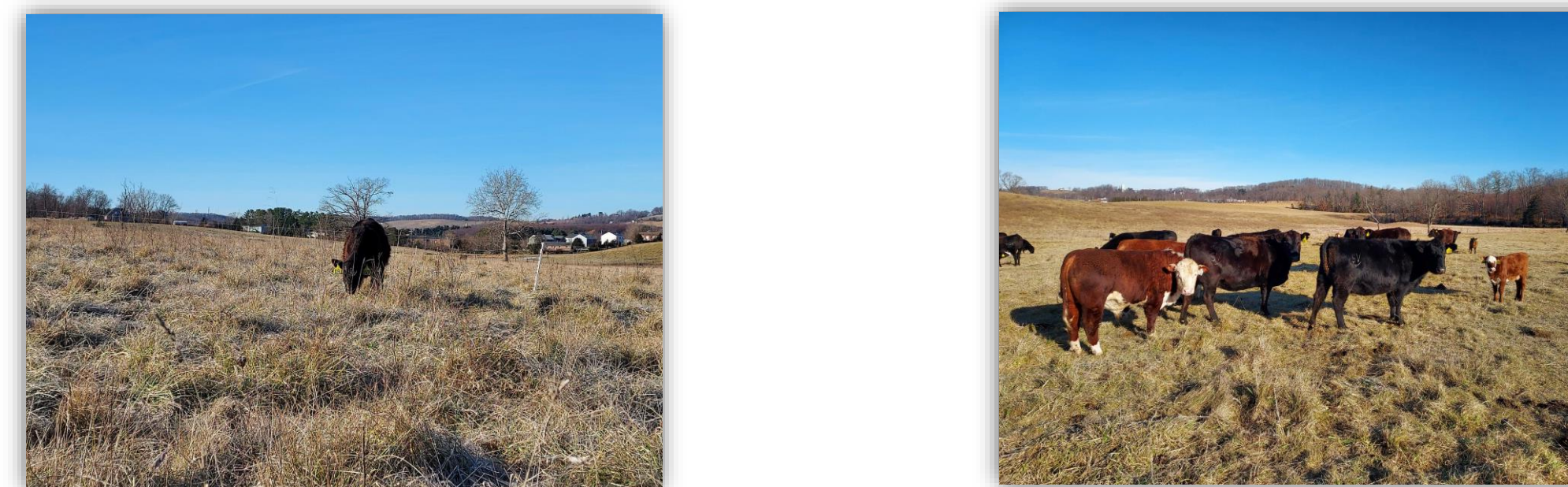


Figure 4 & 5 – Calf grazing ahead of cows & Hereford bull in with cows. Herd genetic makeup is majority Angus, with Simmental, Hereford, Charolais, & Gelbvieh breeds also present.

2014-2023 McCormick Farm Fall Calving Distribution Impact on Weaning Weight

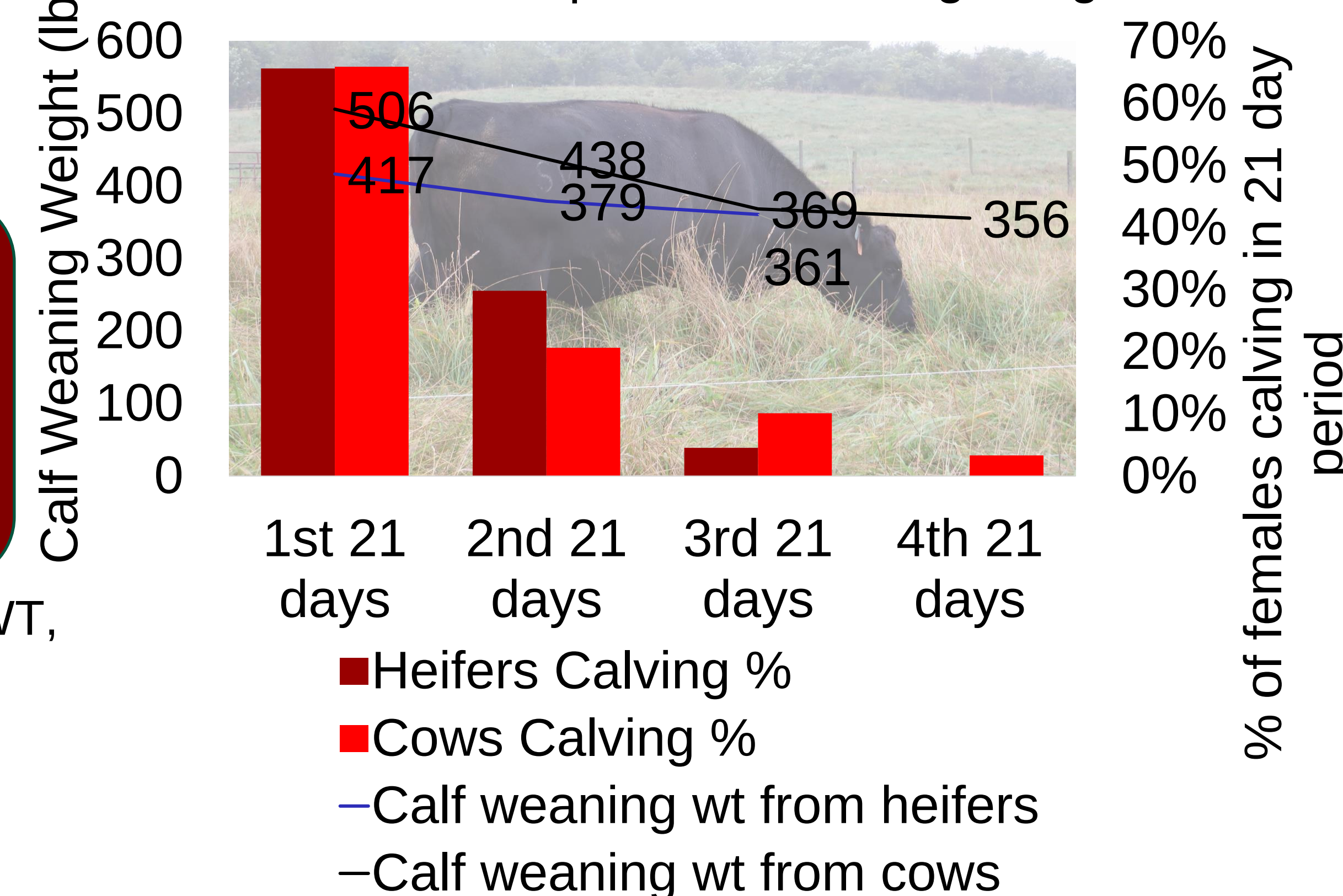


Figure 6 – Calving Distribution Fall Calving Seasons 2014-2024

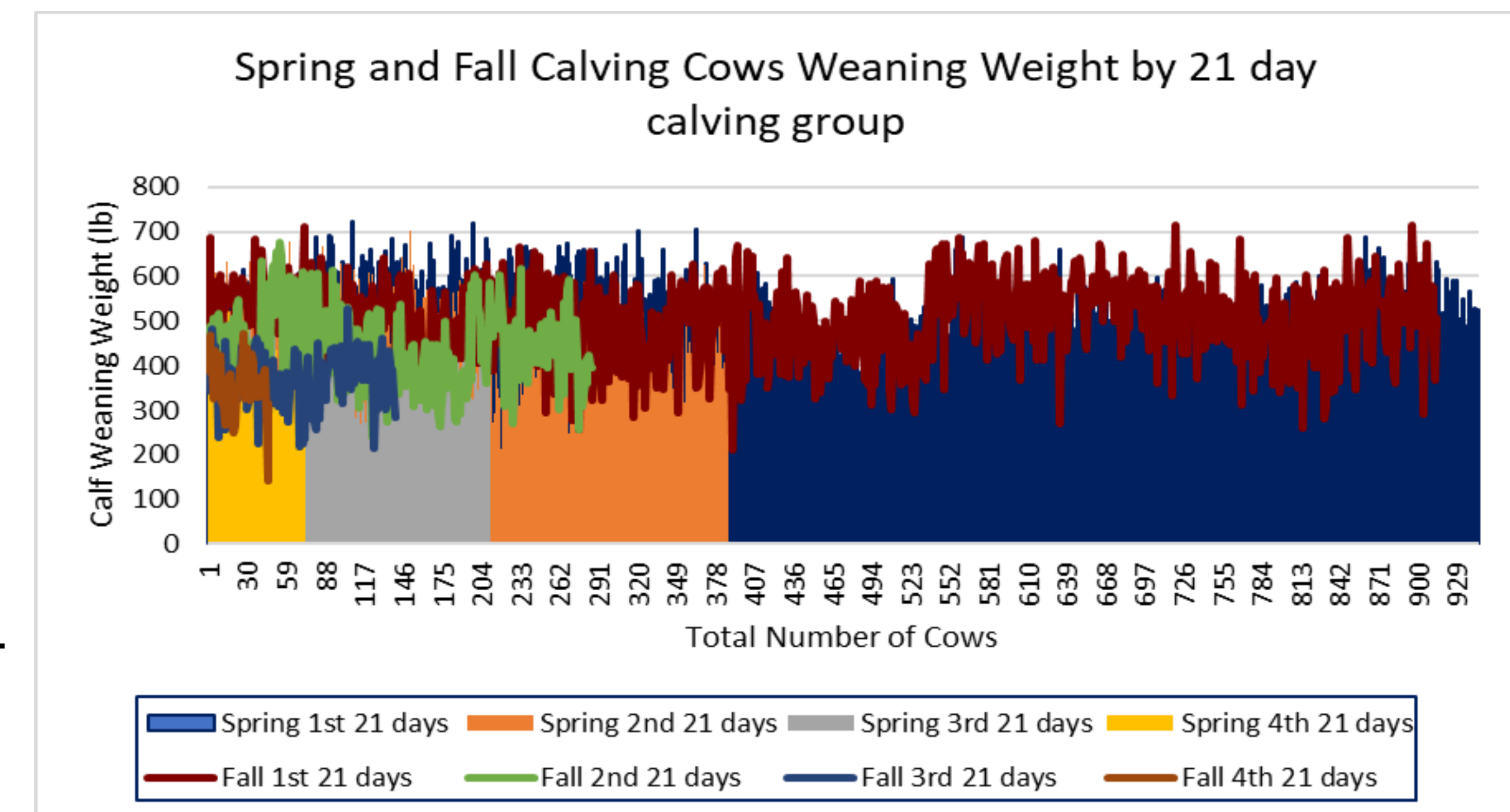


Figure 7 – Weaning Weight by 21-day calving group, Cows

A regression analysis was performed using calf age as the independent variable and calf weight gain from birth to weaning as the dependent variable. Separate regression analyses were performed for heifer calves and steer calves for first calf heifers and mature cows. Average values and coefficient of determination (R^2) values are shown in table 2. R^2 values ranged from 0.29 for steer calves of fall calving mature cows to 0.59 for heifer calves of fall calving first calf heifers. Age of calf may explain between 29% and 59% of the variability in weaning weight.

Table 2. Calf Weight Gain Birth to Weaning

Item	Spring				Fall			
	First Calf		Mature Cows		First Calf		Mature Cows	
	Heifers	Steers	Heifers	Steers	Heifers	Steers	Heifers	Steers
N	198	224	687	753	145	141	711	667
Calf Age (days)	211	204	191	187	223	217	212	212
Gain Birth to Weaning (lb)	365	368	389	403	342	344	388	416
ADG (lb)	1.73	1.80	2.04	2.15	1.54	1.59	1.83	1.97
R ²	0.42	0.36	0.45	0.39	0.59	0.39	0.32	0.29
Standard Error (SE)	56.74	61.54	58.18	66.65	37.45	49.44	49.44	77.72

Conclusions

Spring calves born in the 1st 21 days of the calving season weighed 45 lb (first calf heifers) or 39 lb (mature cows) more at weaning than calves born later in the 2nd 21 days. Fall calves born in the 1st 21 days of the calving season weighed 38 lb (first calf heifers) or 68 lb (mature cows) more than if they were born in the 2nd 21 days. Age of calf described between 29% and 59% of the variability in weaning weights. Spring calves had greater BW, WDA, ADG, and WW. Fall calving cows had a greater % of females calve in the first 21 days, indicating greater fertility.