PERFORMANCE OF EARLY WEANED FALL BORN CALVES GRAZING WHEAT PASTURE

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Story in Brief

These trials were conducted to evaluate alternative management schemes for light weight early weaned calves. Calves from fall-calving cows were early weaned December 10, 1993 (Y1, n=55) and November 29, 1994 (Y2, n= 44) and placed in a drylot for approximately 15 days. During the 15-d receiving period calves received free access to native hay and were supplemented daily with 2 lb of a 40% CP supplement. Following the 15-d receiving period calves were moved approximately 18 miles to the Wheat Pasture Research Unit in Marshall, OK. Calves had free access to water and mineral while grazing wheat pasture. During Y1 calves were taken through grazeout (May 10, 1994), but during Y2 calves were moved to native range at the end of April and grazed to May 11, 1995. Initial weights for Y1 (215 lb) and for Y2 (213) were similar. Average daily gain (ADG) during the receiving period was higher for Y1 compared with Y2 (1.26 vs .28 lb daily). Average daily gain for the grazing period on wheat tended to be greater during Y1 compared with Y2 (1.91 vs 1.71 lb daily). Total ADG from weaning to the end of the grazing season (May) was greater for Y1 compared with Y2 (2.05 vs 1.88). There was a quadratic increase in ADG during Y1 and Y2 as calf age increased. As weight of calf increased there was a linear increase in expected ADG. However during Y2 a quadratic response was observed. Calves weighing less than 300 lb or younger than 160 days did not gain above 2 lb /day which would be common for this weight of calf if suckling the dam. However, calculated gain as a percentage of metabolic body weight did not differ between calves from 100 to 500 lb. This suggests that calves are gaining similarly throughout the grazing period from a metabolic body weight basis. Optimal performance of young light weight calves may be acceptable if the calves are at an adequate initial weight and(or) age prior to grazing wheat pasture.

(Key Words: Early Weaning, Stocker Calves, Wheat Pasture.)

Introduction

With lower calf prices more pressure is placed on the cow-calf segment of the industry to decrease annual cow cost. The practice of early weaning is an option that may decrease feed and land requirements needed per unit of calf

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weaned. The largest problem with this practice is management of the early weaned calf. Early weaning of fall born calves in Oklahoma allows producers the option of utilizing wheat as a forage based growing program for light weight calves. To date there is little research concerning utilization of wheat pasture by young, lightweight calves. The objective of these trials was to quantitate performance of young light weight calves grazing wheat pasture.

Materials and Methods.

Years One and Two. Calves from 55 (Y1) and 44 (Y2) multiparious fall calving cows were early weaned on December 10, 1993 and November 27, 1994. At the time of weaning in Y1 all calves were vaccinated with either Ultrabac 7[1] (5 cc s.c.) or Alpha-7[1] (2 cc s.c.) and during Y2 calves received Ultrabac 7 (5 cc s.c.). One calf died in Y1 two days following early weaning, however this calf was being treated for respiratory illness prior to weaning. Calves were supplemented daily with 2 lb of a 40% crude protein (pelleted cottonseed) and allowed free access to native hay for 20 days in Y1 and 10 days in Y2. Following the receiving period during both years calves were vaccinated with BoviSheild 4 + L5[2] (2 cc i.m.) and TSV-2[2] (2 c.c. intranasal). After vaccination all calves were transported 20 miles to the Wheat Pasture Research Unit near Marshall, OK. Calves had free access to wheat pasture, water, trace mineral salt, and a round bale of grass hay during the grazing period. Calves were monitored daily for sickness and treated with Micotil if rectal temperature was above 104ºF. During Y1 one calf died of polioencephlomacia and all calves during that year received a thiamine (B1 HCL) injection on February 22, 1994. All calves were weighed on and off trial following a 15 h shrink. However, intermittent weights were taken full at approximately 0900.

Statistical Analysis. Data were analyzed as completely randomized design utilizing GLM of SAS (1985). Year was considered the main effect and means compared weight gains at similar times across years. Regression analysis was utilized utilizing GLM (SAS, 1985) and individual response curves were calculated by year. Means were separated utilizing paired *t*-test.

Results and Discussion

Calf Gains. Calves weighed 214 lb in Y1 and 213 lb in Y2 (Table 1; P=.92) at the time of weaning. During the receiving period calves gained faster 1.35 lb/day during Y1 compared with Y2 .64 lb/day (P<.001). This may be attributed to the fact that 13% (n = 6 head) were treated for respiratory diseases

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during the receiving period during Y2. Initial weight gains on wheat were greater (P<.01) for Y1 calves compared with Y2 (1.42 vs .34 lb daily). However, both initial weight gains were lower during the first weight period compared with the following periods in both years. This may reflect an adaptation phase need for the calf to metabolically adjust to the high quality wheat forage. Gains were similar between calves during the grazeout period even though during Y2 calves were moved to summer native range (Y1, 1.45 vs Y2, 1.46 lb; P=.98). Overall ADG while the calves grazing wheat pasture tended to be higher for Y1 compared with Y2 (1.91 vs 1.78 lb). Total ADG for the calves from the time of weaning to May was greater for Y1 compared with Y2 (2.05 vs 1.88 lb; P=.03).

Health. During Y1 no sickness was noted in the calves with the exception of the loss of one calf to polioenceplomacia. However, during Y2 morbidity reached 30% with a mortality of 10% while the calves were on wheat. Most of the illness was respiratory with the exception of one bloat-related death. As mentioned earlier calves were sick prior to the transport to wheat pasture, and this may have attributed to the increased sickness and mortality in Y2 calves.

Regression Analysis. Regression analysis by years revealed a quadratic (P<.01) increase in ADG when ADG is regressed against age (Figure 1). Additionally, as body weight increased there was a linear (P<.01) increase in ADG Y1 and a quadratic (P<.01) increase in ADG during Y2 (Figure 2). Obviously, age and weight are highly correlated variables and both explain a portion of the variation in ADG these light weight calves. Age, weight, and sex were utilized in stepwise regression and did not improve the prediction equation. During the initial periods for both years ADG were below 2 lb/day which may be unacceptable considering calves gain at least 2 lb/day while suckling their dams.

The observation that age and(or) weight limits initial gains on wheat may lead to different strategies during the receiving period. The equations given allow one to predict the average weight at which calves would be expected to gain greater than 2 lb/ day. Calves during Y1 would need to be 160 days of age or 300 lb to attain a rate of gain of 2 lb/day. During Y2 calves would need to be 175 d or 310 lb to attain a similar rate of gain as predicted in Y1. Initial weights for both years were less than the 300 lb estimate needed for a rate of gain above 2 lb/day. Therefore other management techniques such as short term conditioning with a high concentrate diet during the receiving period may increase initial weight and age of calf prior to the grazing period (Purvis and Lusby, 1996).

Overall, calves gained 1.8 lb/day while grazing wheat pasture. There was an increase in ADG as the animals increased in age and weight. Less than optimal weight gains were realized during the first weigh periods during both

years. However, when weight gain was expressed on a percentage of metabolic body weight calves were similar in their gain (Figure 3). This, from a scientific standpoint, means the calves are gaining equal amounts of weight in terms of surface area. However, in practice weight gains are related to body weight and therefore metabolic body weight has little application in pay weights.

Light weight calves will attain an acceptable rate of gain during a 150-d grazing season on wheat if adequate body weight and age is reached. Special management during the receiving period may be needed to increase weight prior to the initial days on wheat. Both age of calf and weight of calf significantly affected predicted ADG of the light weight calf grazing weight pasture.

Literature Cited

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Table 1. The effects of year on liveweight gains in early weaned light weight calves.

Item	Year 1 93-94	Year 2 94-95	P-value
Initial age	75.5	80.4	.14
Weight at early weaning	215	213	.89
Receiving period ADG	1.26	.28	.0004
Weight at the end of receiving	236	216	.03
Wheat pasture ADG			
ADG 1 (Y1, 12/2793 -1/3/94) (Y2, 12/9/94 -1/12/95)	1.42	.34	.006
ADG 2 (Y1 1/3/94 - 2/9/94) (Y2 1/12/95-2/2/95)	1.47	2.49	.005
ADG 3 (Y1 2/9/94-3/3/94) (Y2 2/2/95 - 2/28/95)	1.89	2.07	.15
ADG 4 (Y1 3/3/94 - 3/22/94) (Y2 2/28/95 - 3/30/95)	2.15	1.82	.01
ADG 5 (Y1 3/24/94 - 4/20/94) (Y2 3/30/95 - 4/28/95)	2.84	2.49	.05
Grazeout, ADG 6 (Y1 4/20/94 - 5/11/94) (Y2 4/28/95 - 5/10/95)	1.45	1.46	.98
Total ADG grazing wheat	1.91	1.78	.17
Total ADG. (weaning to May)	2.05	1.88	.03
Total gain	271	278	.49

Figure 1. The effects of age on expected average daily gain in light weight stocker calves.

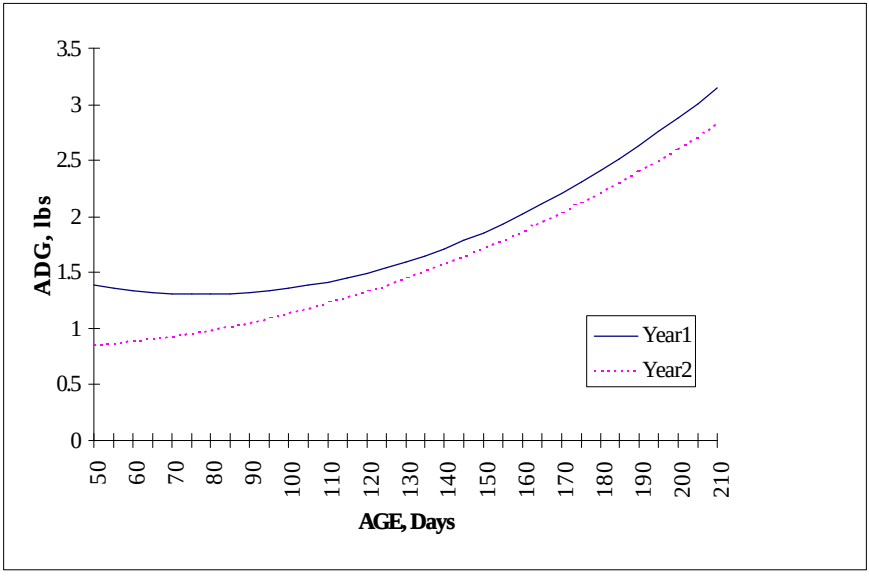
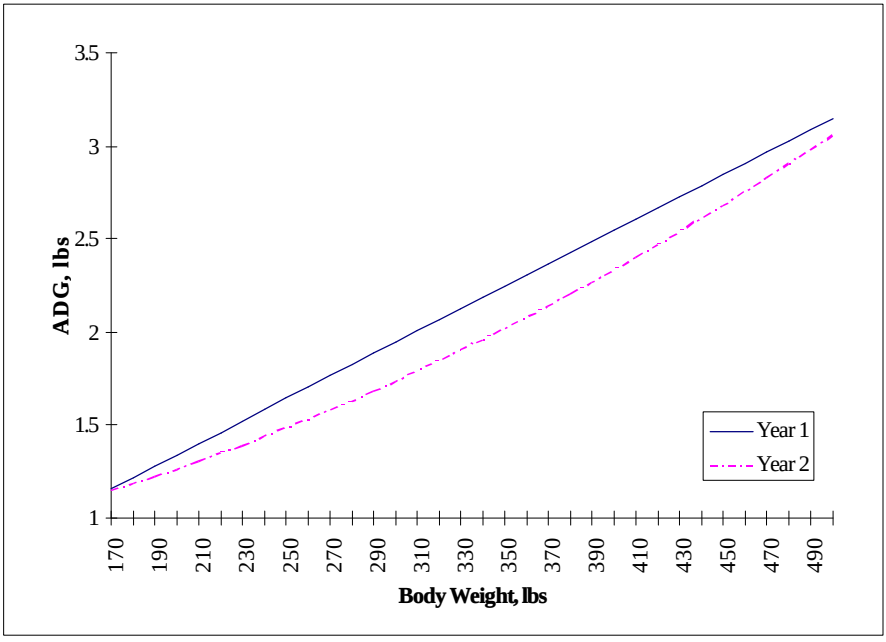


Figure 2. The effects of live bodyweight on expected ADG in light weight stocker calves.



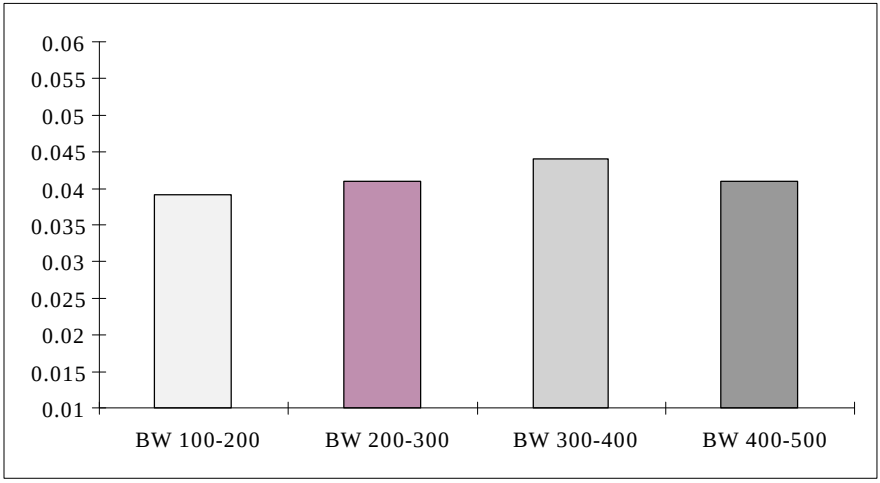


Figure 3. Body weight gain expressed on percent metabolic body weight ($wt^{.75}$).