# EFFECT OF GROWING PROGRAMS FOR PREGNANT REPLACEMENT BEEF HEIFERS ON HEIFER WEIGHT CHANGE, CALF BIRTH WEIGHTS, CALVING DIFFICULTY AND CALF SURVIVABILITY[1]

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## Story in Brief

Seventy-one spring-calving Hereford and Hereford x Angus crossbred heifers (n=40 in year 1; n=31 in year 2) were allotted into three treatment groups during November. All heifers had been previously bred to one Polled Hereford bull so as to calve at 24 ± 1 mo of age. Group I heifers (n=16) were placed on winter wheat pasture from Dec 1 to Feb 1. Group II heifers (n= 22) were given access to a 11.4% crude protein ration in a self-feeder from Dec 1 to Feb 1 while on dormant native range. Group III heifers (n=33) were wintered on dormant native range and 3 lb/day of 40% protein supplement plus grass hay in inclement weather. Groups I and II were maintained in a small pasture during calving; Group III was observed less frequently at calving time. All heifers were fed 3 lb of 40% protein supplement per day and grass hay plus dormant native range from Feb 1 until calving. Birth weights of calves were similar for all treatment groups: 75.2, 78.3, and 76.3 lb for Groups I, II, and III, respectively. Groups I and II had similar calving difficulty scores: 1.5 and 1.7, respectively (1=unassisted; 5=abnormal presentation) and percent requiring assistance (37.5% and 36.4%, respectively.) There was a significant treatment x year interaction in calf survivability. In year 1, 62.5%, 92%, and 100% of the calves survived from Groups I, II, and III, respectively. In year 2, survivability for Groups I, II, and III were 100%, 90%, and 75%, respectively. These data suggest that high quality winter pasture such as small grain pastures can be used for growing pregnant replacement beef heifers without increasing birth weights.

(Key words: Replacement Heifers, Wheat Pasture, Birth Weights, Dystocia.)

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## Introduction

Can pregnant replacement beef heifers be wintered on small grains pasture such as wheat? This question arises when cow-calf producers discuss winter feeding programs for replacement heifers. Researchers and producers have known that heifers that calve in a "good" body condition are much more likely to return to estrus and rebreeed for their second calf than are heifers that are allowed to calve in a thin body condition. Wheat pasture could provide an excellent high-energy, high-protein winter pasture for pregnant replacement heifers. However, some producers have speculated that heifers that calve after grazing small grain pastures seem to have very large calves at birth and therefore an extraordinary amount of calving difficulty. Some have wondered if the high protein content of the wheat forage may be causing larger birth weights, while others believe that the increased fatness of the heifers just provides a smaller birth canal opening and therefore increased dystocia. Occasionally ranchers report instances of apparent uterine fatigue in cows or heifers that undergo parturition while grazing wheat pasture.

## Materials and Methods

Seventy-one spring-calving Hereford and Hereford x Angus crossbred heifers (n=40 in year 1; n=31 in year 2) were allotted by breed and weight into three treatment groups during November. All heifers had been previously bred to one Polled Hereford bull so as to calve at 24 $\pm$ 1 mo of age. Only pregnant heifers were included in the study. All heifers were weighed in mid-November prior to allotment to treatments. Group I heifers (n=16) were placed on winter wheat pasture from Dec 1 to Feb 1 (8 each in 1990 and 1991. The wheat pasture consisted at 43 acres of the OSU Wheat Pasture Research Unit near Marshall, Oklahoma. These heifers had free choice access to a commercial mineral mix containing 20% salt, 16% calcium, 4% phosphorus, 5.5% magnesium, and vitamin A (150,000 IU/lb). Mean intake ($\pm$ Std. Dev.) of the mineral mix during years 1 and 2, respectively, was .28 $\pm$ .04 (n = 6 observations) and .45 $\pm$ .17 (n = 7) lb/head/day. Group II heifers (n= 22) were given free-choice access to a 11.4% crude protein ration in a self-feeder from Dec 1 to Feb 1 while on dormant native range. The ration was 40% ground corn, 35% ground alfalfa hay, 21.3% cottonseed hulls, 3.5% cane molasses, and .2% salt. This group was being fed to mimic the rate of gain and increased fatness of the heifers grazing wheat pasture. Group III heifers (n=33) were wintered on dormant native range and 3 lb/day of 40%

protein supplement plus grass hay in inclement weather. Group III heifers were wintered with a large group of mature cows at the Range Cow Research Center west of Stillwater, Oklahoma.

On February 1 each year the Group I and Group II heifers were moved to a small 10 acre calving pasture near the headquarters for the Range Cow Research Center. All heifers were weighed and body condition scored (BCS) at this time (BCS 1 = emaciated, BCS 9 = obese). Group I and II heifers were monitored approximately every 4 hours during the calving season. Assistance was administered if any heifer was found to be in stage II of parturition for one hour and had not delivered the calf. Group III heifers were in a much larger native range pasture with many mature cows and were observed twice a day (in morning and evening) for calving difficulty. Calving difficulty scores were assigned based on a system of 1 = unassisted, 2 = easy pull, 3 = difficult pull, 4 caesarean section, and 5 abnormal presentation. Birth weights were taken within approximately 24 hours of birth.

All data were analyzed using general linear models procedure of analysis of variance and chi-square tests were used to analyze percentage survival differences. Means presented are least squares means.

## Results and Discussion

All heifers entered the winter season in excellent body condition (BCS =6). Winter weight change (November to February) was greater for heifers grazing wheat or consuming self fed grain ration than for those wintered on native range and protein supplement. Likewise the body condition scores at calving were greater each year for those on the wheat pasture or the self-fed ration. However, it should be noted that the Group III heifers were in a moderate body condition both years and were in especially good (BCS = 5.9) condition in the first year. (See Table 1.)

Because the Group III heifers were under a different management protocol during the calving season, they were observed much less frequently than the Group I or Group II. Due to the difference in observation frequency they were much less likely to receive assistance during parturition, than were the other two groups. Therefore the calving difficulty scores and percentage of heifers assisted should not be compared between Group III and the other two groups. Calving difficulty scores and percentage of heifers assisted were similar (Table 2.) for the wheat pasture (Group I) heifers and those that were fed the self-fed ration (Group II). There was a treatment by year interaction for percentage of calves surviving at least two weeks. Chi-square analysis indicated that differences in survivability within each year were not statistically significant. Herdsmen calving the heifers in year 1 noted some of the heifers

**Table 1. Winter weight change (lb) and body condition at calving (BCS) of heifers wintered on wheat pasture, self-fed, or wintered on native range and protein supplement.**

| | Group I Wheat pasture | Group II Self-fed | Group III Native and protein |
|---|---|---|---|
| Winter Weight change | | | |
| Year 1 | 189.2[a] (8)[d] | 200.0[a] (12) | -1.65[b] (21) |
| Year 2 | 150.7[a] (8) | 192.9[b] (10) | 34.3[c] (12) |
| BCS at calving | | | |
| Year 1 | 6.4[a] | 6.6[a] | 5.9[b] |
| Year 2 | 5.8[a] | 6.4[b] | 5.2[c] |

[abc] Means in the same row with different superscripts are different (P<.05)

[d] Numbers in parenthesis are numbers of heifers

**Table 2. Calving difficulty scores, percentage heifers assisted, percentage calves surviving, and mean birth weights (lb) for heifers wintered on wheat pasture, self-fed, or native range and protein supplement.**

| | Group I Wheat pasture | Group II Self-fed | Group III Native and protein |
|---|---|---|---|
| Calving difficulty score[a] | 1.5 | 1.7 | - - - |
| Percentage heifers assisted[a] | 37.5 | 36.4 | - - - |
| Percentage survival[a] | | | |
| Year 1 | 62.5 | 92 | 100 |
| Year 2 | 100 | 90 | 75.0 |
| Birth weights (lb)[a] | 75.2 | 78.3 | 76.3 |

[a] (P>.05)

from the wheat pasture group and the self fed group may have experienced uterine fatigue. However, this difference was not observed in year 2. There was no difference in birth weights due to treatment or year. Therefore heifers wintered for two months on the wheat pasture or fed the self-fed ration did not have larger calves at birth. Regression models containing BCS and day of the calving season indicated there was no relationship ($p > .2$) between day of the calving season that parturition took place and birth weight or calving difficulty. Likewise BCS was not a significant source of variation in birth weight of calves or calving difficualty. From this study we can conclude that heifers wintered for two months prior to calving on winter wheat will not have increased birth weights in the calves. Further research is needed to understand the possible causes of uterine fatigue or inertia and if high quality cool season pasture contributes to increased dystocia due to uterine fatigue at calving.