FACTORS AFFECTING PREGNANCY RATES AND CALVING DIFFICULTY IN COMMERCIAL BEEF HEIFERS

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Summary

Data from yearling Angus and Angus crossbred beef heifers from a commercial ranch were used to identify factors affecting pregnancy rates (n= 342) and calving difficulty (n= 295). Production data analyzed included prebreeding weight, average daily gain during the breeding season, and postbreeding weight; evaluations of hip height, frame score, weight:height ratio, and reproductive tract score were made at approximately 1 yr of age. Pregnancy rates were affected significantly by weight:height ratio, prebreeding weight, and reproductive tract score. However, based on correlation coefficients, the magnitude of influence of these traits on first-service conception and overall pregnancy rates was low. Calving difficulty in the same heifers (n= 295) was influenced significantly by calf birth weight, heifer yearling frame score, and average daily gain of the heifer during the breeding season. Heavier calf birth weight increased calving difficulty, whereas increases in frame score and average daily gain reduced calving difficulty.

(Key Words: Heifer Development, Pregnancy Rate, Calving Difficulty.)

Introduction

The demand for efficient production has created more intensive management of beef cattle operations. For the cow-calf producers, proper heifer development is the first step to increase efficiency within the cow herd. To determine how specific production practices can influence conception rates and calving ease in yearling heifers, data were collected from a cooperating ranch.

Experimental Procedure

Yearling Angus and Angus-cross beef heifers (n= 342) from a commercial cattle ranch were used to analyze factors affecting pregnancy rates and calving difficulty. Heifers arrived at a commercial heifer development facility at approximately 10 mo of age and were managed to attain approximately 65% of their projected mature body weight at time of breeding. Measurements, including prebreeding weight, hip height (used to calculate weight to height ratio and frame score), pelvic area, and reproductive tract score (scale 1= highly developed to 5= least development), were obtained at approximately 1 yr of age.

Estrus was synchronized by feeding melengesterol acetate (MGA) at 0.5 mg per hd/d for 14 d. A subcutaneous injection of a

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prostaglandin analog was administered 17 d following removal of MGA from the diet. Heifers exhibiting behavioral estrus were inseminated artificially 12 h following visual detection of heat. Heifers that failed to respond were reinjected with the prostaglandin analog 7 d later. All heifers were observed for an additional estrous cycle and rebred if behavioral estrus was exhibited. Only artificial insemination was used during the breeding season. All heifers were bred to projected calving-ease sires.

Pregnancy was determined by ultrasound, and final weight was recorded 45 d following the conclusion of the breeding season. Final weight, sire of calf, and average daily gain of the heifers (prebreeding weight to final weight) also were used in the analysis.

Pregnancy was reconfirmed by calving results. Heifers calved at 2 yr of age (n= 295), and birth weight, sex of calf, and degree of calving difficulty were recorded (1= unassisted, 2= pulled, 3= difficult pull, 4= Cesarean section, 5= abnormal presentation). This information, plus the previous heifer development data, was used to evaluate factors affecting calving difficulty using a stepwise regression procedure. Categorical predictive statistical models were developed for the individual response variables by a stepwise procedure, using a backward elimination strategy. With this method, all possible relevant variables were fit to a model.

Results and Discussion

The average values for the production data used in the analysis are shown in Table 1. Overall pregnancy rate was affected by weight to height ratio (P< .05), which is an indication of the heifer's body condition at breeding, prebreeding weight (P< .05), and the reproductive tract score (P< .07). An increase in weight to height ratio (body condition) was correlated with an increase in pregnancy rates; increases in prebreeding weight and reproductive tract score were correlated to a slight but significant decrease in pregnancy rates. Although these traits had a significant influence on pregnancy rates, the correlation coefficients were very low, indicating that magnitude of their influence was small.

Calving difficulty was influenced by calf birth weight (P< .01), yearling frame score (P< .05), and average daily gain during the breeding season (P< .09). As expected, heavier calf birth weight resulted in increased calving difficulty. As frame score and average daily gain during the breeding season increased, calving difficulty was reduced.

Table 1.   Average Values for Production Data Used in the Analysis

Item	Average	Standard Deviation
Production Data (n= 342)		
Prebreeding weight,lb	752.9	58.1
Final weight, lb	874.4	66.1
Total gain, lb	121.5	29.2
Avg daily gain, lb/d	1.09	.29
Reproductive tract score	2.7	.8
Frame score	4.9	.7
Weight:height ratio	2.8	.2
First-service conception rate, %	67.1	47.1
Overall pregnancy rate, %	86.6	34.1
Calving Data (n= 295)		
Yearling pelvic area, in.^{2}	225.3	19.4
Calf birth weight, lb	70.8	10.9
Calving ease score	1.23	.51
% calving difficulty		
1 No assistance	79.7	
2 Slight assistance	16.6	
3 Difficulty birth	3.1	
4 C-section	.3	
5 Abnormal presentation	.3	