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EFFECTS OF INDUCED HYPOTHYROIDISM ON WEIGHT GAINS, LACTATION AND REPRODUCTIVE PERFORMANCE OF FIRST CALF BRAHMAN COWS

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Background. To insure rebreeding success, it is essential that first calf heifers continue to gain weight during the postpartum period. Induction of hypothyroidism has been shown to increase weight gains and body condition of mature cows and growing steers and heifers. Additionally, hypothyroidism in dairy cows has been associated with reductions in milk yield. A temporary reduction in milk production should theoretically make more energy available for gain and subsequent reproduction. It is hypothesized that induction of hypothyroidism in first calf Brahman cows would cause an increase in body weight and condition score combined with a decrease in milk production which should contribute to more satisfactory rebreeding performance.

The objective of this experiment was to evaluate the effects of hypothyroidism on cow body weight, body condition score, calf gain, milk production and subsequent reproduction.

Research Findings. Eighteen first calf spring calving Brahman cows (BW=937±30.4 lbs BCS=5.0±.2 units) were utilized to study the effects of thyroid manipulation on weight gain, milk production, and reproduction. Nine cows served as controls. Nine cows were induced to become hypothyroid by daily ingestion of 4 mg/kg BW of 6-n-propyl-2-thiouracil (PTU). Cows were assigned to treatment one day (d) post-calving based on season of birth, BW, body condition score (BCS), calf sex, and calf sire. The treatment period lasted for 84 d and was followed by a 56 d post-treatment period. Cow BW, BCS and calf weight were recorded biweekly. Milk production was estimated at 14, 28, 56, 84, 98, 112, and 140 d postcalving. Weekly blood samples were obtained for hormone analysis. Hypothyroidism was effectively induced in all PTU cows during the treatment period. PTU cows gained more (P=.002) weight (120±16.8 lbs) and tended (P=.06) to gain more body condition (.61±.17 units) than control cows (34.6±16.8 lbs; .11±.17 units) during the treatment period. Control calves gained at a faster rate (1.9±.09 lbs/d; P<.01) than PTU calves (1.5±.09 lbs/d) during the treatment period. Milk production was lower (P<.05) in PTU cows on d 56 and 84. During the post-treatment period all trends were reversed so that BW, BCS, calf weight, and milk production were similar between the two groups by d 140. Additionally, no differences were observed in weaning weight (d 189) between the two groups suggesting that the suppression in milk yield was only transient. Reproductive performance was not affected by induction of hypothyroidism.

It was hypothesized that induction of hypothyroidism would cause an increase in body weight and condition. It is accepted that postpartum cows in a positive energy balance are more likely to rebreed

in a restricted breeding season. In addition, the reduction in milk production in PTU cows should have caused a further improvement in energy balance that would result in more energy available for reproduction. Induction of hypothyroidism was successful in increasing cow weight and BCS gains and suppressing milk production during the treatment period, but these changes were not successful in improving reproductive performance of first calf Brahman cows.

Application. Alteration of thyroid status influences body weight and condition score via alteration of basal metabolic rate. Additionally, suppression of milk production contributed to the improvements in energy balance. These changes in metabolism were not successful in altering reproductive performance of first calf Brahman cows.