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Effect of Daylength on Reproductive Performance of Brahman Cattle

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EFFECT OF DAYLENGTH ON REPRODUCTIVE
PERFORMANCE OF BRAHMAN CATTLE

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GENERAL INTRODUCTION

The length of daylight has been shown to play an important role in reproductive performance of farm animals. Generally, as the days get shorter (as in the fall), more problems are found by the rancher trying to get his Brahman cattle pregnant. The main causes for the drop in reproductive performance in the fall are thought to be due to: (1) decrease in intensity and or duration of heat or total lack of an observed heat and/or (2) lack of the shedding of an egg from the ovary (ovulation). If the bull or A.I. technician fails to observe the cow in heat, there is no chance for the cow to get pregnant. Several scientific papers report that Brahman cows are affected by seasonal changes in respect to reproductive performance. As the seasons change to shorter daylength and lower temperatures, observation of standing heats decreases and the incidence of shedding the egg (ovulation) after standing heat decreases. Systems to eliminate these reproductive problems would be of benefit to ranchers.

GENERAL SUMMARY

The use of artificial lighting to stimulate reproductive function in seasonal breeding animals has been shown to be effective in species other than cattle. Three field trials were conducted with Brahman cattle to determine the affect of artificial lighting on the reproductive performance of fall breeding Brahman cattle. The first trial gave tentatively positive results. After the latter two trials, the conclusion must be that extending the daylength on fall breeding Brahman cattle in the manner used in these trials does not alter reproductive performance. Further parameters must be studied in order to increase reproductive efficiency of the fall breeding season in Brahman cattle.

Three trials were conducted to measure seasonal effects on reproductive hormones in Brahman cows. The first of these trials indicates that the Brahman is more dramatically affected by season than are the European breeds. The function of the corpus luteum, the gland that produces progesterone and maintains pregnancy, is dramatically depressed during the winter. The second of these trials shows that Brahman cows fail to have normal preovulatory LH surges during the winter. This means that the egg is not shed from the ovary and that conception cannot occur. We have found that an increase in energy nutrition alleviated this problem to a great extent. In the third trial, we found that serum progesterone (the hormone of pregnancy) was affected by season and the level of energy nutrition.

The recommendation that must be made from these data is to increase the level of grain feeding through the fall or winter breeding season. If the level of grain feeding is increased to about 40% of the diet, the LH surge should be near normal and progesterone levels will also be near normal compared to summer levels when Brahman cattle exhibit their highest fertility.