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Abstract

Twelve cows were given a preliminary treatment of testosterone proprionate and were used to help us detect other cows in heat. We used two types of testosterone booster treatments to maintain male sex behavior in both age groups of cows. Two cows from each treatment or age group were paired and placed with 40 or 60 cows for 30 to 50 days. Two hundred forty-nine cows were observed in heat and 240 (96.4%) were marked by the detector cows. In this experiment, testosterone proprionate boosters maintained cows as heat detectors more effectively than testosterone enanthate boosters.

Keywords

Cattlemen's Day, 1978; Report of progress (Kansas State University. Agricultural Experiment Station); 320; Beef; Testosterone; Heat detection; Proprionate

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Summary

Twelve cows were given a preliminary treament of testosterone proprionate and were used to help us detect other cows in heat. We used two types of testosterone booster treatments to maintain male sex behavior in both age groups of cows. Two cows from each treatment or age group were paired and placed with 40 to 60 cows for 30 to 50 days.

Two hundred forty-nine cows were observed in heat and 240 (96.4%) were marked by the detector cows. In this experiment, testosterone proprionate boosters maintained cows as heat detectors more effectively than testosterone enanthate boosters. Also, old cows marked more cows in heat than did young cows.

Introduction

Several aids have been developed to help improve heat detection and artificial insemination. Most aids can be classified as: (1) devices attached to females being observed or (2) devices attached to detector animals.

Disadvantages of devices attached to females being observed are false positives from crowding or another cow in heat mounting a cow not in heat, loss of aids, and delayed detection. But the aids are superior to cntinuous observation or observing dairy during milking time.

Detector animals can be prepared several ways. A vasectomized bull can be used but problems with venereal disease and some cases of fertility have resulted. Bulls sometimes lose sex drive if the penis is amputated, adhered to the sheath, or physically blocked (penal block). Surgical displacement of the penis sometimes causes edema and irritation from urine in association with the tunnel formed for the penis. Heat detection with surgically altered bulls, however, is superior to a herdsman's observations.

Cows culled because of low mothering ability, infertility, or low production can be used as detector animals. Injecting 200 mg. testosterone proprionate every other day for 20 days then injecting long-acting testosterone enanthate one month and two months later induces pronounced male sexual behavior in cows. They are as efficient as vasectomized bulls.

Testosterone enanthate is more expensive and less readily available to producers than is testosterone proprionate, so we wanted to determine: (1) if testosterone proprionate could be substituted for testosterone enanthate as the booster injection; and (2) whether age of cows is a

factor in their effectiveness as heat detectors.

Materials and Methods

Twelve Hereford, Polled Hereford, and crossbred Simmental cows were treated with testosterone and used as heat detectors. Each received intramuscular injections of 200 mg. testosterone proprionate on alternate days until 10 injections had been given. Cows were classified as aged (6 to 8 years) or young (2 to 4 years), and allotted to the following groups: (1) aged cows, 200 mg. testosterone proprionate every 10 days; (2) aged cows, 1 gm testosterone enanthate every 14 days; (3) young cows, 200 mg. testosterone proprionate every 10 days; or (4) young cows, 1 gm. testosterone enanthate every 14 days. A cow from each treatment was paired with a cow from another treatment. Each had a chin-ball marker with a different color from her partner. All possible pairs were made among the four treatment groups. Once paired, treated cows were not separated during the experiment. Each pair was placed in a pasture with 40 to 60 open, beef cows suckling calves. The cows were checked for marks and other signs of heat twice daily for 30 to 50 days. Testosterone proprionate was purchased from Burns-Biotic, Oakland, CA., and testosterone enanthate, from Sigma Chemical Co., St. Louis, MO.

Results and Discussion

The aged cows injected with testosterone proprionate marked the highest percentage of cows in heat. Aged cows injected with testosterone enanthate were next then young cows in the same treatment order as the old cows (Table 1.1). Age of cow and type of testosterone significantly affected heat detection. Mature cows were more active than young ones. Part of the increased sexual activity is likely a "learned response". This study, it appeared that age and treatment were additive. Old detector cows marked 20.9 percent more cows in heat than young detector cows did. Cows treated with testosterone proprionate marked 16.4 percent more cows than those treated with testosterone enanthate. The combination resulted in the aged, testosterone-proprionate cows marking 37.4 percent more cows than young testosterone-enanthate cows did.

Of the 249 observed heats, 240 were marked by treated cows and were artificially inseminated at this heat. One cow conceived, one cow did not return to heat for the remaining observation period, and seven returned to heat, were marked again, and all seven then conceived. This enforces two points: (1) treated cows were marking cows in heat, and (2) cows that were not marked may not have been in heat when judged so.

Pairing had varied effects on detection efficiency (Table 1.2). The young, testosterone-proprionate cow paired with a young, testosterone-enanthate cow marked 97.5% of the estrual cows, while the young testosterone-proprionate cow paired with a more aggressive, aged, testosterone-proprionate cow marked only 37.3% of the estrual cows. Since aged cows treated with testosterone proprionate were more aggressive than young cows treated with testosterone proprionate and young cows treated with testosterone proprionate were more aggressive than young cows treated with testosterone enanthate, the young testosterone-proprionate detector may have had no opportunity to mount. An aggressive detector may protect an estrual cow. However, when more than one cow was in heat, an aggressive detector could

not protect all of them. Also, standing heat is longer when more than one cow is in heat, which would give a less aggressive cow more opportunities to mount.

Since testosterone proprionate maintained male behavior in heat detector animals more effectively than testosterone enanthate, we concluded that it can be used effectively because testosterone enanthate previously was superior to or equal to any other heat detection method. Older cows were more effective heat detectors than young cows. Detection aids, of course, are only aids to heat detection and must not be relied on entirely.

Table 1.1. Age of cows and type of testosterone related to efficiency of detector cows.

Age and treatment[1] detectors	No. of cows in heat	No. of cows marked
Aged TP	153	136 (88.9%)
Aged TE	112	82 (73.2%)
Young TP	134	92 (68.7%)
Young TE	99	51 (51.5%)
Aged	265	218 (82.3%)
Young	233	143 (61.4%)
TP	287	228 (79.4%)
TE	211	133 (63.0%)
Total	249	240 (96.4%)

[1]Aged cows (6 to 8 years) and young cows (2 to 4 years) were given a preliminary treatment of 200 mg. testosterone proprionate (TP) every other day for 20 days then booster injections of either 200 mg. TP every 10 days or 1 gm. testosterone enanthate (TE) every 14 days.

Table 1.2 . Age pairing effect of detector cows and type of testosterone used in heat detection.

Age and treatment detectors	No. of cows in heat	No. of cows marked
Young TP	40	39 (97.5%)
Young TE		21 (52.5%)
Aged TP	59	58 (98.3%)
Young TP		22 (37.3%)
Aged TP	38	31 (81.6%)
Young TE		17 (44.7%)
Aged TP	56	47 (83.9%)
Aged TE		32 (57.1%)
Aged TE	35	32 (91.4%)
Young TP		31 (88.6%)
Aged TE	21	18 (85.7%)
Young TE		13 (61.9%)