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High concentrate feeding and growth promotants for Brahman crossbred steers

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Abstract

Two experiments using *Box indicus*×*Bos taurus* steers were carried out to investigate the effectiveness of three growth promotants; zeranol, oestradiol-17β and oestradiol benzoate-progesterone in association with high concentrate feeding. In contrast to most reported work none of the three treatments significantly ($P>0.05$) affected growth rate, final liveweight or fat depth.

INTRODUCTION

As lot feeding costs are high there is a need to maximise growth rate. Growth promotants are commonly used for this purpose. Although their effectiveness has been widely demonstrated, there have been some reports, particularly from feedlots in Queensland, of failure to increase gain, (Venamore *et al.* 1982 and Hodge *et al.* 1986).

Information on the product oestradiol benzoate-progesterone under Queensland conditions is scarce and more so its effectiveness in Brahman crossbred steers under feedlot conditions. Therefore we investigated the effectiveness of this compound, zeranol and oestradiol-17β in feedlots.

MATERIALS AND METHODS

The two experiments were carried out in a feedlot 45 km south-east of Springsure (24°23′S, 148°21′E) Queensland. The steers used were bred and reared on native pastures on the property. At the time of introduction into the feedlot the cattle were vaccinated against the major clostridial diseases. All growth promotants were implanted in the ear, subcutaneously, at the manufacturers recommended sites.

The time of slaughter was determined by unfasted liveweight and the manager's estimate of fat cover. Therefore, a number of drafts of animals were slaughtered on different occasions in each experiment.

Approximately one hour after slaughter, carcass weight and subcutaneous fat depth at the sacral crest site (Johnson and Vidyadaran 1981) were measured.

Experiment 1

One hundred and thirty-two Brahman crossbred (1/2 to 3/4 *Bos indicus*×*Bos taurus*) steers aged 3 to 3.5 years were introduced into the feedlot and treatments were imposed nine days later. Steers were fed an initial ration and over a period of 8 days progressively

brought onto a 90% sorghum ration. At commencement of the experiment, the steers (457.7±44.2 kg) were allocated by stratified randomisation to the following treatment groups on unfasted liveweight:

1. Control, C, 34 steers;
2. 20 mg oestradiol benzoate and 200 mg progesterone 100 day implant (Synovex-S), OB-P, 34 steers.

The average feeding period for the steers in Experiment 1 was 75 days.

Experiment 2

One hundred and thirteen Brahman crossbred steers *Bos indicus*×*Bos taurus* steers aged 2 to 2.5 years were used in this experiment.

All steers in this experiment were treated with injectable levamisole (Nilverm®) at commencement of the experiment.

The introductory feeding regime took 26 days to reach a 90% sorghum diet. After 58 days 2% molasses was added to the ration and the grain changed from 90% sorghum to 40% sorghum and 48% wheat for the rest of the experiment.

At the start of the experiment the steers (411.2±34.6 kg) were allocated by stratified randomisation to the following treatment groups on unfasted liveweight:

1. Control, C, 25 steers;
2. 36 mg zeranol implant (Ralgro®), ZERA, 28 steers;
3. 20 mg oestradiol benzoate and 200mg progesterone implant, OB-P, 30 steers; and
4. 24 mg oestradiol-17β implant (Compudose 200), O-17β, 30 steers.

The average feeding period for the steers in Experiment 2 was 75 days.

Statistical analysis

The data from both experiments were analysed by a least squares analytical model for unequal cell numbers using initial unfasted liveweight as a covariate (Harvey 1960), to correct for bias in initial treatment means. Pairwise differences between treatments were tested using a protected least significant differences technique.

RESULTS

The results are shown in Tables 1 and 2. In no group was there a significant ($P<0.05$) response to treatment with a growth promotant.

Table 1. Experiment 1: Effect of growth promotant on feedlot gain, sale liveweight, carcass weight and sacral crest fat depth

Parameter	Control	OB-P
Number of steers	34	34
Feedlot gain (kg/day)	1.51	1.87
Sale liveweight (kg)	588	614
Carcass weight (kg)	333	339
Fat depth (mm)	11.2	13.8

Table 2. Experiment 2: Effect of growth promotants on feedlot gain, sale liveweight, carcass weight and sacral crest fat depth

Parameter*	Control	ZERA	OB-P	0-17β
Number of steers	25	28	30	30
Feedlot gain (kg/day)	2.15	2.16	2.25	2.22
Sale liveweight (kg)	566	567	573	569
Carcass weight (kg)	299	298	300	294
Fat depth (mm)	10.1	11.6	11.9	12.8

* F values for each parameter were not significant ($P<0.05$).

DISCUSSION

Overseas workers have reported significant ($P<0.05$) positive responses to growth promotants under feedlot conditions Perry *et al.* (1970), Kahl *et al.* (1978), Wagner *et al.* (1979), Mathison and Stobbs (1983), Van Der Wal and Berende (1983) and Brown (1983). Similarly, significant ($P<0.05$) positive responses to ZERA and 140 mg trenbolone acetate combined with 20 mg oestradiol-17β (TBAO) have been recorded under feedlot conditions in Australia (Hodge *et al.* 1986; A.W. Plasto pers. comm. 1986) in *Bos indicus*×*Bos taurus* and *Bos taurus* steers. However, Venamore *et al.* (1982), have documented results from two feedlot sites where *Bos taurus* steers, *Bos indicus*×*Bos taurus* and *Bos indicus* steers, respectively, were fed high grain feedlot rations and ZERA implants failed to produce significant ($P>0.10$) responses over periods of 82 and 74 days, respectively. Hodge *et al.* (1986) and A. W. Plasto (pers. comm. 1986) have both recorded cases where there have been no significant ($P>0.05$) responses to ZERA implants in *Bos indicus*×*Bos taurus* steers fed high energy rations under feedlot conditions for periods of 72 days and 102 days, respectively. While these failures to respond to treatment have a common denominator in genotype and feed, the same genotypes given similar feed have in other reported research have had increased liveweights as would be expected (Hodge *et al.* 1986).

The comparitively short period of feeding may have been a contributory cause.

Treatment is not without some undesirable treatment effects. We observed side effects of bulling, preputial 'tipping', prolapses and elevated tail heads with the growth promotants used. Similar side effects were reported by Dickie and Forsyth (1982) and Knights and Venamore (1985). The side effects did not appear to affect growth rate or carcass composition in these experiments but if preputial prolapses were traumatised and strictures and urinary retention occured, this could affect liveweight gain (T. J. Tierney pers. comm. 1986).

The uncertainty of response, and possibility of undesirable side effects must be considered when deciding whether or not to treat Brahman steers, in feedlots, with the compounds we used.

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