# AN EVALUATION OF ZERANOL IMPLANTS IN FATTENING STEERS

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## SUMMARY

Liveweight response by fattening steers to Zeranol implants was measured at eight sites in central Queensland. At two sites steers grazed forage sorghum and the response was highly significant (P <.005). Improved pasture provided grazing at one site and the response approached significance (P <.10). Oats provided the major source of grazing at three sites resulting in significant responses (P <.005 and P <.05) at two sites but not at the third (P 7.10). Steers were fed high grain feed-lot rations at two sites and Zeranol implants failed to produce significant (P 7.10) response at either site.

At three of the eight sites the effect of Zeranol implants on different genotypes was observed. Generally Bos taurus steers gave the same response to treatment as Bos indicus-Bos taurus steers.

## INTRODUCTION

Zeranol, a resorcylic acid lactone, is considered to act as a growth stimulant by increasing the production and release of growth hormone. Evaluation of this compound under temperate conditions in feed lots has suggested that growth rates of fattening steers are improved (Sharp and Dyer 1971). In Botswana, trials conducted to measure the performance of fattening steers implanted with Zeranol under grazing and feedlot conditions indicated advantages of 11 to 24% (Shorrock et al 1978).

Marketing of Zeranol in Australia as Ralgro commenced in October 1979. However, limited information was available for cattle grazing tropical and sub-tropical pastures. This paper presents the results of a series of trials designed to measure the effect of Zeranol implants on liveweight gain of steers under grazing and feed lot conditions in central Queensland.

## MATERIALS AND METHODS

Liveweight data of steers treated or untreated with Zeranol (Ralgro-Cooper Wellcome Australia) were collected from eight commercially managed herds. The treatment periods ranged from 69 to 112 days prior to slaughter. These periods were determined by the owner of each group of steers.

Steers were treated with three 12 mg pellets implanted in the lateral surface of the ear according to the manufacturer's recommendation. At trial site five, an extra treatment group was included to test the effect of using twice the dose.

At trial site one, two, three and six, crossbred Bos indicus-Bos taurus cattle were used. Both Bos indicus-Bos taurus and Bos taurus were represented at trial four. Bos indicus-Bos taurus and Bos indicus (greater than three-quarters) were used at trial site five, while at trial site seven, only Bos taurus were used. Trial site eight had Bos taurus, Bos indicus-Bos taurus and Bos indicus steers.

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Advantage to treatment in terms of final live weight may be a more appropriate measure for commercial purposes. This can be calculated from Table 1 and shows that there was 2 to 5% advantage to the Zeranol treated steers over the control steers in the trials that showed significant responses.

The lack of measurable response to Zeranol in feed-lot at trial sites seven and eight is not inconsistant with reported work. Sharp and Dyer (1971) reported results from a number of experiments and found that response varied with concentrate-roughage ratio, type of grain and initial live weight of the cattle used. Bennett et al (1974) also reported a series of trials under feed lot conditions where response to Zeranol was variable.

The data from these eight trial sites and from the 26 other sites throughout Queensland were plotted and multiple regression equation fitted. This equation was $y = - .002 + ,377 x - ,212 x^2$ where y = estimate response to Zeranol (kg/d) and x = daily gain of the control group ($R2 = .255$; $P < .01$). Response was defined as the daily gain of the treated group - daily gain of the control group. This response tended to peak at liveweight gains of .75 to 1.00 kg per head daily.

The effect of Zeranol implants on the different genotypes represented in trial sites four, five and eight and the effect of the double dose of Zeranol in trial five is shown in Table 2.

TABLE 2 The effects of zeranol on liveweight gain in various genotypes

| Trial site | Genotype | Control | 36 mg Zeranol | 72 mg Zeranol |
|---|---|---|---|---|
| 4. | *Bos taurus* | 1.410 | 1.460 | - |
| | *Bos indicus Bos taurus* | 1.206 | 1.424 | - |
| 5. | *Bos indicus Bos taurus* | .831 | .860 | .880 |
| | *Bos indicus* | .471 | .500 | .550 |
| 8. | *Bos taurus* | 1.573 | 1.665 | |
| | *Bos indicus Bos taurus* | 1.440 | 1.580 | |
| | *Bos indicus* | 1.331 | 1.333 | |

In trials four and eight there was no genotype by treatment interaction indicating that the effect of Zeranol was consistant between genotypes. There was a significant ($P < .05$) genotype by treatment interaction in trial five with an apparently higher response to 72 mg Zeranol in the Bos indicus group. Owing to the variation in response to Zeranol reported in this paper and previously published data together with variation in response between 36 mg and 72 mg dose rates (Sharp and Dyer 1971) the interaction observed in trial five may not be genuine.

It is interesting to note that under high nutrition and freedom from parasite effects the Bos taurus had higher liveweight gains than the Bos indicus-Bos *taurus,* which in turn had higher gains than the Bos indicus. In trial 4 the genotype differences approached significance ($P < .10$) while in trials 5 and 8 the significance levels were $P < .005$ and $P < .01$ respectively. Where nutritional and parasitic stress is minimal Bos taurus cattle express higher growth rates than Bos indicus cattle or their crosses. This is largely due to differences in appetite (Frisch 1976).

These data were analysed by the least squares method (Harvey 1960) to estimate treatment effect on daily gain and final live weight. Where more than one genotype was represented the treatment by genotype interaction was fitted. Initial live weight was used as a covariate in each analysis. The steers were allotted to treatment groups at random.

To assist interpretation of these trials, daily gain and the response to Zeranol from 26 other trials throughout Queensland were assembled. Most of these trials are unpublished and the data were obtained from internal reports of the Queensland Department of Primary Industries. These data were combined with the data reported in this paper and were analysed to see if the daily gain of control cattle was associated with the response to Zeranol treatment.

## RESULTS AND DISCUSSION

Table 1 shows the liveweight response to Zeranol treatment at each trial site.

TABLE 1 Liveweight gain of control and zeranol treated steers at various trial sites

| Trial site | Nutritional regime | No. days | No. steers | Initial live-weight (kg) | Control gain (kg/d) | Zeranol gain (kg/d) |
|---|---|---|---|---|---|---|
| 1. | Forage sorghum with access to native pasture/ fine stem stylo | 103 | 24 | 486 | .741 | 1.010*** |
| 2. | Forage sorghum | 112 | 99 | 490 | .747 | .912*** |
| 3. | Oats with access to buffel grass | 69 | 144 | 505 | .727 | .911*** |
| 4. | Oats with access to buffel | 76 | 90 | 472 | 1.308 | 1.442* |
| 5. | Oats with access to native pasture | 82 | 109 | 452 | .651 | .680 n.s. |
| 6. | Green panic pasture | 112 | 27 | 458 | .990 | 1.158 1 |
| 7. | Feed-lot (high grain) | 82 | 82 | 280 | .923 | 1.040 n.s. |
| 8. | Feed-lot (high grain) | 74 | 129 | 311 | 1.448 | 1.526 n.s. |

*** P $\leq$ .005 * P $\leq$ .05 1 P $\leq$ .10 n.s. P > .10

In trials one to four and six theresponse to Zeranol ranged from 10 to 37% in terms of increased liveweight gain per head daily. There was no measurable response to treatment in trial five. Responses in daily liveweight gain in previous work with grazing cattle have shown similar variation to that reported here (Bennett et al 1974 Shorrock et al 1978).

Generally the responses to Zeranol reported in this paper were consistent with previously published data. There appears to be a need for some detailed research designed to more precisely define the reasons for variation in response to Zeranol implants.

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