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EFFECT OF DIPPING ON THE GROWTH RATE OF GRAZING CATTLE

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SUMMARY

Eighteen sets of twin cattle were used in an experiment to measure the effect of stresses associated with control of the cattle tick (*Boophilus microplus*) on the growth rate of grazing cattle. On nine occasions in a simulated tick eradication programme, three groups each of 12 cattle were either (a) weighed only (control), or (b) driven a total of 4·8 km and weighed, or (c) driven a total of 4·8 km, dipped in an organo-phosphate acaricide, and weighed. The cattle were checked regularly on treatment days for tick burdens, but these were insignificant.

Productivity of the cattle was unaffected by treatments during the trial, which lasted 102 days.

I. INTRODUCTION

Approximately 30% of the Australian beef cattle population is found in areas in which the cattle tick *Boophilus microplus* (canestrini) exists, and it has been estimated that the total annual cost of the cattle tick to both Governments and producers is in excess of $40 million (Anon 1973). This represents about 4% of the gross value of cattle slaughtered in 1972–3 and an annual total direct and indirect cost of about $5 per head of cattle found in the infested areas (Anon 1973).

Apart from labour and acaricide costs, a common complaint from producers in tick areas is that dipping cattle causes loss of weight (R. E. Dunham, personal communication 1975). Anon (1959), on the basis of estimates by producers, suggested that a single dipping may cause weight losses as great as 2·3 kg per beast. Despite estimates of weight loss resulting from tick parasitism in the range 0·5 kg per engorged tick per year (Little 1963) to 0·28 kg per engorged tick per year (Turner and Short 1972) there is still producer resistance to tick control programmes, based on the belief that dipping itself may cause severe weight losses.

In order to assess the effects of a dipping programme and the associated handling on the productivity of grazing cattle, an experiment was conducted at the Husbandry Research Farm, Rocklea, Brisbane. At the time of the experiment, the farm was considered to be virtually free of ticks, which would minimize the complicating effect of tick parasitism.

II. MATERIALS AND METHODS

ANIMALS. The experimental cattle were 18 sets of either monozygous or dizygous twins of mixed dairy and beef breeding. Their mean age at the commencement of the experiment was 37·6 months, with a range from 14 to

82 months. All animals had been reared at the Husbandry Research Farm, Rocklea, from the age of 1 to 2 months, and all reacted negatively to serological tests for brucellosis, contagious pleuropneumonia, *Leptospira pomona,* and to the single intradermal test for tuberculosis. Before entering the experiment they were drenched with a broad spectrum anthelmintic.*

During the course of the experiment, the cattle grazed predominantly paspalum (*Paspalum dilatatum*) pastures.

DESIGN AND TREATMENTS. A balanced incomplete block design was used. After stratification on the basis of the mean fasted liveweight of the twin pair, the 36 twins were allocated to three groups each of 12 individual twins in such a way that co-twins were in different groups. The groups were then randomly assigned to the following treatments—Group 1: control. Group 2: mustered. Group 3: mustered and dipped.

Throughout the experiment the three groups of cattle grazed together and, on treatment days, they were brought into yards for weighing, a distance of about 300 m. The control group was drafted off during weighing and returned to pasture immediately.

In an attempt to simulate mustering conditions on semi-intensive grazing properties in south-east Queensland, groups 2 and 3 were driven together approximately 3·2 km along laneways before group 3 was dipped. Groups 2 and 3 were then recombined and driven a further 1·6 km before being returned to pasture.

The plunge dip was charged with coumaphos† throughout the experiment which lasted 102 days, and treatments were applied on nine occasions at five intervals of 10 days followed by three intervals of 17 days. This pattern conformed with short-interval dipping programmes commonly used to assist in the control of cattle ticks with selective acaricide resistance.

MEASUREMENTS. Individual full and fasted (24 h without feed, 16 h without water) liveweights (LW) of all animals were recorded at the commencement of the experiment and immediately following the final treatment.

Tick counts were made on the left-hand side of all animals in groups 1 and 2 after alternate 10-day intervals and after each 17-day interval. Tick counts were also made on group 3 animals at the commencement and termination of the experiment. All ticks found were removed for identification and to estimate their stages of development.

III. RESULTS

The results were analysed as a balanced incomplete block design, and LW and average daily gain (ADG) data are presented in table 1. Differences between groups in initial and final fasted LW were not significant ($P = 0{\cdot}05$), and ADG was unaffected by treatments ($P = 0{\cdot}05$).

Two ticks were found during the first 10 weeks of the experiment, one each in groups 1 and 3. At the next two counts, the average tick burdens per side were 4·3 and 5·2 for cattle in groups 1 and 2 respectively. Almost all ticks found were more than 14 days of age.

* Thibenzole—Merck, Sharp and Dohme (Aust.) Pty. Ltd., Granville, 2142 New South Wales.
† Asuntol New—Bayer Australia Ltd., Botany, 2019 New South Wales.

TABLE 1

MEAN INITIAL AND FINAL FASTED LIVE WEIGHTS, AND AVERAGE DAILY GAINS OF THREE GROUPS EACH OF 12 CATTLE SUBJECTED TO A SERIES OF NINE ACARICIDAL DIPPINGS

	Group 1 Control	Group 2 Mustered	Group 3 Mustered and Dipped	S.E. of Difference
Initial fasted LW (kg)	312·7	299·2	316·7	9·19
Final fasted LW (kg)	377·9	366·0	379·3	9·25
Average daily gain (kg per head)	0·64	0·66	0·62	0·037

IV. DISCUSSION

Fasted LW were obtained on the day following the final treatment, when transient effects were most likely to be expressed, and the absence of significant treatment effects at this time suggests that growing cattle are unlikely to be adversely affected by the mustering and dipping procedures encountered under semi-intensive grazing conditions in south-east Queensland. A similar conclusion was reached by McCulloch and Barrow (1970) with steers slowly losing weight. The situation may, however, be different in the case of drought-stricken animals, which are less able to cope with the physical rigours of mustering and dipping. The type of acaricide used may also be important but the organo-phosphate used in this experiment had no apparent effect on production.

A build-up of the cattle tick population on the pastures occurred during the experiment, and light tick burdens were present on both the undipped grounds of cattle late in the experimental period. However, these burdens were not heavy enough or of long enough duration to affect markedly the performance of the animals (Little 1963).

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REFERENCES

ANON (1959).—Report, Commonwealth Bureau of Agricultural Economics. 'The Economic Importance of Cattle Tick in Australia'.

ANON (1973).—The Cattle Tick in Australia. Inquiry by the Cattle Tick Control Commission. p. 11.

LITTLE, D. A. (1963).—The effect of cattle tick infestation on the growth rate of cattle. *Aust. vet. J.* 39:6-10.

MCCULLOCH, R. N. and BARROW, L. J. (1970).—Effects on production of dipping cattle to control ticks. *Agric. Gaz. N.S.W.* 81:295-9.

TURNER, H. G. and SHORT, A. J. (1972).—Effects of field infestations of gastrointestinal helminths and of the cattle tick (*Boophilus microplus*) on growth of three breeds of cattle. *Aust. J. agric. Res.* 23: 177-93.

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