

The Effect of Ticks on the Growth-rate of Cattle

BY JOHN FRANCIS*

A recent survey (Bureau of Agricultural Economics, 1959) indicated that the economic loss caused from cattle tick, in Queensland alone, amounted to almost £10 million per annum. There have, however, been no close experimental observations comparing the growth rate of tick infested and tick free cattle running under the same conditions. It was the purpose of the present experiment to provide this information.

SUMMARY

During a 34 week period, a group of Hereford, heifers maintained free from tick infestation gained 223 lbs. or 21 lbs. more than a group carrying an average of 109 ticks.

The previously infested group was then cleaned of ticks and became the control group, and the previous control group was infested. During the subsequent 30 weeks, the control group gained 144 lbs. or 53 lbs. more than the infested group, carrying an average of 73 ticks.

There were concomitant changes in haemoglobin and haematocrit readings.

TECHNIQUE

Two matched groups of ten Hereford heifers were used. One group was artificially infested with ticks (*Boophilus microplus Canestrini*) and the other group maintained free of ticks by spraying with D.D.T. from 13/3/58 to 11/11/58. Infestation was carried out with approximately half a gram of tick larvae at intervals throughout the experiment to maintain a moderate tick infestation in the appropriate group. At first, these larvae were spread on the back but at a later stage sacking was tied under the abdomen and the larvae spread between the sacking and abdomen. The two groups ran under identical conditions on the Veterinary School Farm, Brisbane. On 11/11/58 the groups were reversed: that is the previously infested group was cleaned of ticks with D.D.T., and the clean group was infested with larvae. The total number of engorged female ticks was counted on each of the infested heifers five days a week, except on a few occasions during the period of observation.

RESULTS

It will be seen from Figure 1 that during the 34 week period between 13/3/58 to 11/11/58, the control group gained 223 lbs. and the infested group 202 lbs., i.e. the control group gained 21 lbs. or 10% more than the infested group that carried an average of 109 ticks. Over the 30 week period from 11/11/58 to 9/6/59, after the groups were reversed, the clean group gained 144 lbs. and the newly infested group 91 lbs., i.e. the control group gained 53 lbs., or 58% more than the infested group, with an average burden of 73 ticks.

Concurrent observations were carried out on haemoglobin and red cell volume, and it will be seen from Figure 1 that following the reversal of groups on 11/11/58, haemoglobin and haematocrit figures dropped in the newly infested group, and rose in the new control group.

* Department of Preventive Medicine, Veterinary School, University of Queensland.

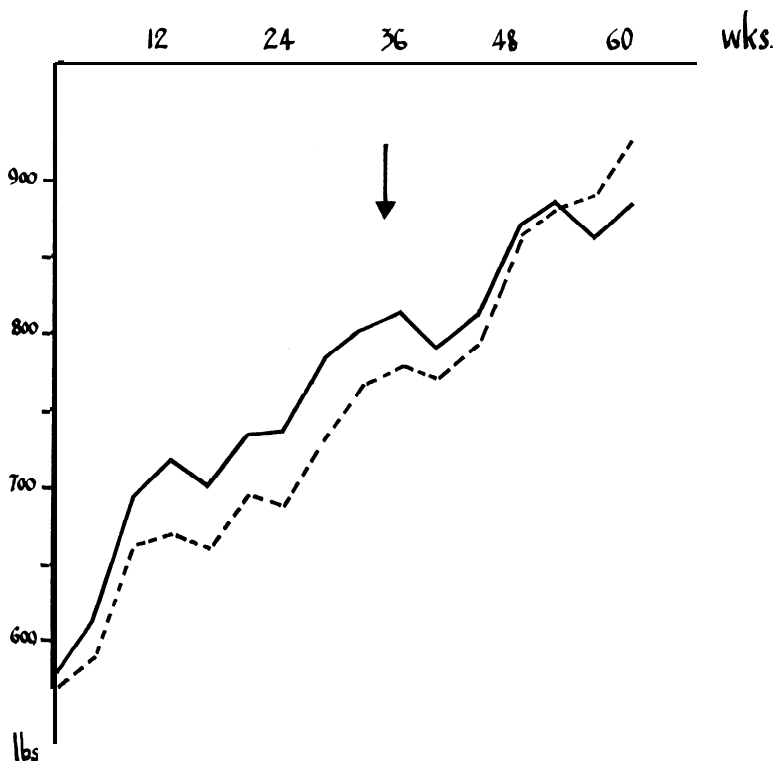


Figure 1.—Growth rate of two groups of ten Hereford heifers from 13/3/58 to 9/6/59. The dotted line represents the group originally infested. On 11/11/58 (arrow) the infestation was reversed.

DISCUSSION

The findings recorded represent only preliminary observations which are now being extended but it will be seen that if the results of both periods are combined, an average burden of about 90 ticks reduced the growth from 367 lbs. to 292 lbs. over a period of 64 weeks. This represents a loss of 65 lbs. per annum, and the clean group gained on the average 26% more than the infested. This conforms with the estimated loss of 60 lbs. per annum by the Bureau of Agricultural Economics (*loc. cit.*). The average burden of 90 ticks in the present series of experiments must be regarded as a light infestation, and it seems probable that when tick infestation is severe, the loss of meat production would be considerably more than 60 lbs. per annum.

This conclusion is supported by the result of Norman (1957) in the Northern Territory. He sprayed one group of cattle with 0.5 per cent. W/V pp'-isomer D.D.T. at intervals from November, 1956, to May, 1957, that is the normal growth period for the area. A second group of cattle acted as controls.

Over this period of six months, the sprayed cattle gained 132 lbs. or 90 lbs. more than the unsprayed group. Unfortunately Norman gives no information on the severity of tick infestation in the unsprayed group.

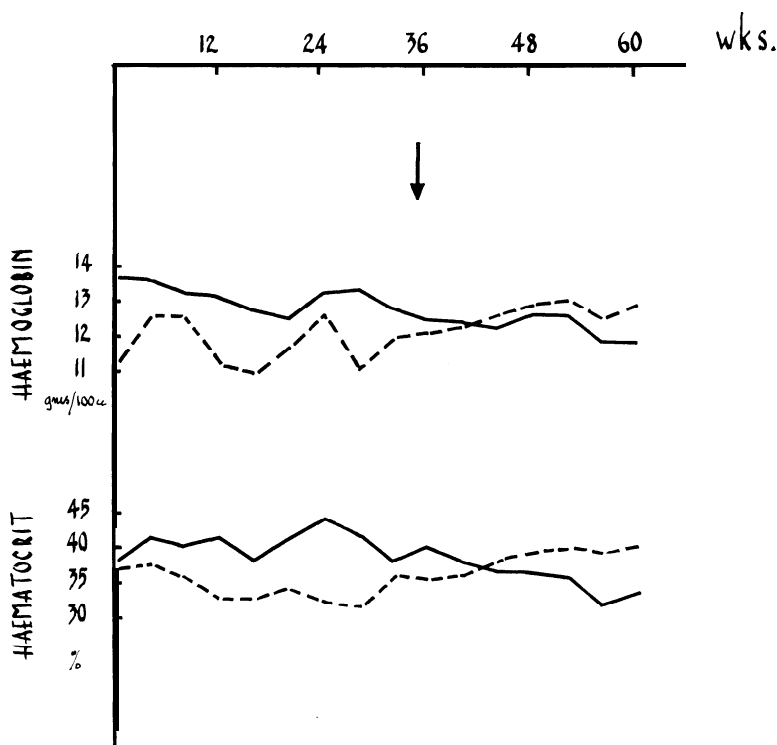


Figure 2.—Haemoglobin and concentration levels of groups as in Figure 1. The dotted lines represent the group originally infested.

REFERENCES

- Norman, M. J. (1957).—*J. Aust. Inst. Agric. Sci.* 23: 344.
 Bureau of Agricultural Economics (1959). Report on the Economic Importance of Cattle Tick in Australia.

DISCUSSION

P. G. Schinckel (N.S.W.) asked Professor Francis for his definition of tick resistance.

Answer.—Resistant cattle seem to have the ability to prevent the ticks maturing on them and Zebu-cross cattle do also possess the ability to lick off more ticks than do British cattle.

D. N. Sutherland (Qld.).—The levels of infestation reported would generally be regarded as light and relatively harmless commercially.