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INVESTIGATIONS INTO THE COPPER STATUS OF
SHEEP GRAZING AT DIFFERENT STOCKING LEVELS

A thesis presented in partial fulfilment
of the requirements for the degree
of Master of Agricultural
Science in Animal
Science at
Massey University

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1974

ABSTRACT

A series of experiments were conducted to investigate the possible role of copper in limiting animal production at high stocking rates.

Copper and selenium were administered to 494 four-tooth Romney ewes grazing at two different stocking rates. A significant ($p < 0.01$) increase of 0.74 kg in lamb weaning weight was attributable to the supplementation of both elements. A depression in clean fleece yield ($P < 0.05$) and a small improvement in fleece crimp clarity ($P < 0.05$) were associated with copper and selenium supplementation respectively. Although both these effects reach significance at the $P = 0.05$ level, they are considered to be due to chance.

A winter fall ($P < 0.01$) in mean plasma copper level was recorded in the high-stocked ewes.

Further investigations were undertaken in another flock of 550 Romney ewes. Factors influencing plasma, liver and wool copper were determined and relationships between plasma copper level and various fleece and body variables assessed.

Period and stocking rate were both shown to significantly ($P < 0.05$) affect mean plasma copper. No effect of lambing rank or age of ewe could be shown. A small stocking rate by age interaction was recorded ($P < 0.05$) but this is considered to have arisen by chance.

Of eighty one correlation coefficients determined between plasma copper level and various fleece and body variables, only six were statistically significant ($P < 0.05$). No biological basis could be found to account for those shown to be significant. They are considered to have arisen by chance.

No effect of stocking rate on either ewe or 'dead' lamb liver copper level could be established.

Monthly wool copper determinations indicated that the mid-winter, pre-lambing sampling was significantly depressed. No effect of stocking rate, age of ewe, or breeding rank could be established. Significant ($P < 0.05$) between-sheep differences were apparent.

Concurrent determinations of wool zinc indicated a marked depression due to both an increased stocking rate, and the onset of winter and/or pregnancy ($P < 0.01$). Older ewes had higher mean wool zinc values ($P < 0.05$).

Additional observations on the plasma samples collected in previous experiments were undertaken. Mean plasma zinc levels were found to be significantly ($P < 0.01$) depressed by both a higher stocking rate and the onset of winter and/or pregnancy.

ACKNOWLEDGEMENTS

The author wishes to thank Dr G.A. Wickham for his supervision and encouragement throughout the course of this study. My thanks are also extended to Miss L.E. Thomsen and Miss C.A. Addis for the analysis of the wool samples, as well as to the other members of the Massey University Sheep Husbandry Department's technical and farm staff who were involved in the collection of blood samples and management of the experimental flocks.

Special thanks are also extended to

Dr N.D. Grace, for the collection of the liver biopsy samples and for many helpful discussions.

Mr R.D. Anderson, who made available his computer programme for variance component estimations.

Professor R.E. Munford, for assistance with statistical analyses.

Dr R.R. Brooks, for permission to use the Atomic Absorption Spectrophotometer.

My appreciation is also extended to Mrs A.F. Barton who has accepted the task of typing this manuscript.

The work was carried out while the author received financial assistance from the Corrigil Trust.

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