

Reproductive Disturbances of Romney Ewe Lambs grazed on Red Clover (*Trifolium pratense*) Pastures

ON March 10, 1958, 111 Romney ewe lambs (group A) which had grazed continuously since weaning (December 12, 1957) on pastures dominant in red clover were joined with an additional 92 Romney ewe lambs (group B) for studies of their breeding season. This latter group had grazed, since weaning (December 11, 1957), on perennial rye-grass-white clover pastures. Vasectomized, ochred rams were run with these lambs from March 17, 1958, all being grazed together on perennial rye-grass-white clover pastures. All lambs were weighed on March 19, group A and group B having the same average live weight (71 lb.). On the same day, that is, within two days of joining with teasers, 29 lambs from group A but none from group B were found to have been marked. This sudden onset of oestrus from one group of lambs was unexpected in view of the previous results¹ on the breeding season of Romney ewe lambs. Owing to the relatively early age at first oestrus shown by these lambs, laparotomy was performed within five days of observed oestrus to determine whether ovulation had occurred. Both the left and right ovaries of eight lambs were examined without finding any evidence of the existence of corpora lutea. Graafian follicles of varying sizes, however, were seen on most ovaries.

Red clover², like Australian subterranean clover³, has been reported to contain substances with oestrogenic effects. In order to investigate whether the observed oestrus without ovulation in the lambs described earlier could have resulted from the oestrogenic activity of the red clover dominant pastures, random samples of this pasture were collected on March 25. These samples, consisting almost entirely of red clover, were freeze-dried, ground in a hammer mill and fed to 21-day-old, ovariectomized white mice in an attempt to detect the presence of substances with oestrogenic effects by the mouse uterine weight technique⁴. The control diet consisted of 50 per cent (by weight) barley meal and 50 per cent butter milk powder. The 'clover' diet was made up from 75 per cent (by weight) control diet and 25 per cent 'clover' pasture. Results from two feeding periods of 10 and 11 days respectively were combined and are presented in Table 1.

Table 1. THE EFFECTS OF FEEDING 'CLOVER' DIET TO MICE (SEVEN MICE PER GROUP)

Treatments	Control	'Clover'
Initial body-wt. (gm.)	8.76	8.64
Final body-wt. (gm.)	15.10	10.07
No. of vaginal openings	1*	7
Mean and S.D. of uterine wt. (mgm.)	5.36 ± 0.99	10.57 ± 2.67

* Suspected to be an artefact.

These results indicate that the 'red clover' pastures contained substances which have potent oestrogenic effects. It is also probable that ingestion of 'red clover' pastures over a period of time as occurred in the present case has induced oestrus without ovulation in the lambs. It is of interest to note that Australian workers⁵⁻⁷ have repeatedly pointed out that lowered fertility of breeding ewes grazing subterranean clovers was not attributable to the failure of oestrus as detected by ochred rams. If the present findings are also applicable to breeding ewes, then under certain conditions, 'oestrus without ovulation'

may represent an additional complication in studies of female infertility in sheep.

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T. S. CH'ANG

Sheep Husbandry Department,
Massey Agricultural College,
University of New Zealand,
Palmerston North,
New Zealand.
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Molybdenum Content of Equine Liver Tissue

THE discovery that molybdenum is a component of the enzyme xanthine oxidase¹ has directed interest to the presence of this element in animal tissue, particularly liver. I have found that adult horse liver tissue contains highly variable levels of molybdenum.

125 specimens of adult horse liver were obtained from a Cambridge slaughter-house during a period of eight months. The liver samples were dried at 100° C. and the dried material analysed for molybdenum by the thiocyanate-stannous chloride method of Dick and Bingley². The range of molybdenum content of the tissues is shown in Fig. 1.

While 109 of the 125 livers were within the range 3-19 p.p.m., five livers had molybdenum-levels of 42.0, 47.6, 54.8, 76.4 and 84.6 p.p.m. of tissue dry-matter. The total ash contents of these latter five samples were within the normal range.

Comparing these figures with the data given by Underwood³, it has been found that molybdenum accumulates in the liver to a greater extent in the horse than in cattle or sheep. The reason for the accumulation of this element is not known, but it is

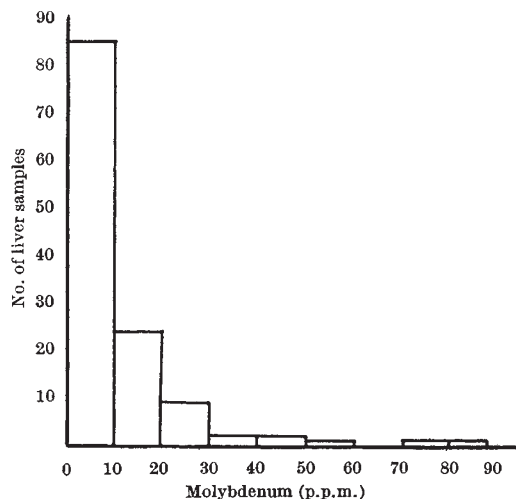


Fig. 1. Range of molybdenum contents of 125 samples of equine liver