During May–October 1947, fæces were collected daily from a group of sheep on rotational grazing, and analysed for dry matter, nitrogen and ash.

Fæcal dry matter figures from these sheep indicated that the amount of the daily feed intake was almost independent of the grazing available, but increased steadily with increase of body size. This was at variance with consumption estimated by a mowing machine technique (sampling grazed and protected areas of the sward) which appeared proportional to the amount of feed available[4]. This is because, especially when keep is short, stock obtain much of their feed below the level at which most mowing machines can cut. At times when much growth was available, the mowing machine over-estimated consumption, due to the protected sward growing more rapidly than the grazed sward[5]. The results of these experiments suggest that the usual mowing machine techniques at present used by agronomists may be valueless as methods of measuring with precision the herbage consumed by the grazing animal.

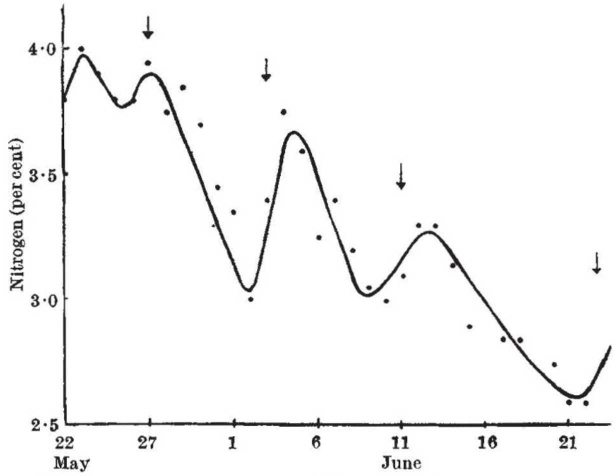
Results of experiments in which mown herbage was fed to sheep in cages[6], together with those from a large number of similar experiments, conducted at Jealott's Hill Research Station[7], have shown the following relation between the nitrogen content of the dry matter of grass fed and of the oven-dried fæces produced :

$$\text{per cent N in feed} = 0{\cdot}795 \times \text{per cent N in ash-free fæces} + 0{\cdot}14 \ (t = 17).$$

The grass fed varied from that cut for hay or silage to closely grazed pasture grass; but different constants may apply for other feeds such as lucerne, mountain pasturage, etc.

Considering the process of selective grazing by sheep, it is likely that, day by day, the nitrogen content of their feed from a single plot will decrease, because they are progressively removing the leafiest, nitrogen-rich growth available, and leaving the stemmy part of the growth for subsequent grazing. A move to fresh herbage will make feed of higher nitrogen content available, and the nitrogen in the feed should thus exhibit a periodicity with movement from plot to plot. If, as is suggested by the regression formula given above, the fæcal nitrogen bears a direct relationship to feed nitrogen, the former should show a similar periodicity, with the time-lag of approximately two days normally assumed for the feed to pass through the gut. Analysis of the daily fæcal nitrogen from the grazing sheep has shown this to be so (see accompanying graph) and suggests that in fact the nitrogen content of fodder grazed from one plot does decrease day by day. As the nutritive value of herbage is roughly proportional to its nitrogen content[8], the feeding value of the grazing on this plot decreases daily, and the average percentage starch equivalent depends on the overall intensity of grazing.

Thus the fæcal nitrogen from grazing sheep gives a figure for nitrogen in feed grazed which is probably more accurate than that obtained by analysis of cut herbage. Experiments are now in progress at this Station to find whether analysis of fæces for other constituents (for example, lignin, as suggested by Maynard *et al.*[9], but making due allowance for the factor of selective grazing) together with nitrogen estimations will give a direct measure of the quality of the feed intake. Such analyses could be made on fæces collected from the sward, and need not demand the harnessing of stock. If it is confirmed that the main factor controlling dry matter intake is body-weight, then we should have available a method for measuring the daily intake of nutrients by the grazing animal.



AVERAGE DAILY PERCENTAGE OF N IN ASH-FREE FÆCES FROM TEN SHEEP ON ROTATIONAL GRAZING. ARROWS MARK DAY OF ENTRY OF STOCK ON TO A NEW PADDOCK : THE EFFECT OF INCREASING MATURITY OF HERBAGE DURING THE PERIOD IS SHOWN BY LOWER FÆCAL-N FIGURES ON THE LATER PADDOCKS

I should like to thank Mr. W. S. Ferguson for permission to use figures from the Jealott's Hill experiments and my colleagues at this Station for their considerable help in the present investigations.

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[1] Woodman, H. E., Evans, R. E., and Eden, A., *J. Agric. Sci.*, **27**, 212 (1937).
[2] Davies, William, *J. Min. Agric.*, **32**, 106 (1925).
[3] Stapledon, R. G., *J. Min. Agric.*, **34**, 11 (1927).
[4] Johnstone-Wallace, D. B., and Kennedy, K., *J. Agric. Sci.*, **34**, 190 (1944).
[5] Linehan, P. A., Lowe, J., and Stewart, R. H., *J. Brit. Grass. Soc.*, **2**, 145 (1947).
[6] Grassland Improvement Station, Experiments in Progress (London: H.M. Stationery Office, 1948).
[7] Ferguson, W. S. (privately communicated).
[8] Watson, S. J., and Horton, E. A., *J. Agric. Sci.*, **26**, 142 (1936).
[9] Matrone, G., Ellis, G. H., and Maynard, L. A., *J. Animal Sci.*, **5**, 285 (1946).

Perithecia of Oak Mildew

FORMATION of perithecia of the oak mildew is a rare occurrence in Britain, the only record known to me being that of Robertson and Macfarlane[1], who found one leaf with six perithecia at Bricket Wood, Hertfordshire, on October 6, 1945. It is therefore of some interest to note that a few perithecia were found on leaves of *Quercus robur* at Aberystwyth on October 2, 1947. The identification of the fungus as *Microsphæra alphitoides* Griff. and Maubl. was kindly made by Mr. S. J. Hughes, Imperial Mycological Institute, who compared the Aberystwyth material with a slide of Robertson and Macfarlane's specimen deposited in the Herbarium of the Royal Botanic Gardens, Kew.

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[1] Robertson, N., and Macfarlane, I., *Trans. Brit. Mycol. Soc.*, **29**, 219 (1946).