

RATE OF HERBAGE INTAKE AND GRAZING TIME IN RELATION TO HERBAGE AVAILABILITY

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Summary

Preliminary results of studies relating rate of herbage intake and grazing time to herbage availability are reported. A new technique for measuring grazing time is outlined.

1. INTRODUCTION

Willoughby (1959) discussed the relation of herbage availability to animal production and stressed the importance of such a relationship in the sphere of pasture production and grazing management. In his studies, Willoughby reported maximum animal growth in the Canberra environment when the availability of green herbage exceeded 1400 lb dry matter (d.m.)/acre. Scott Young (1960) on the other hand, working in Adelaide, South Australia, observed maximum growth in young Merino wethers grazing sown pastures of green herbage with a yield of 600 lb (d.m.)/acre. Such a difference might be expected in view of the many variables that affect the relationship, viz., type of animal, age, weight, previous nutritional history, pasture type, botanical composition, plant spacing, and harvesting technique. Nevertheless, the large difference emphasizes the need for a closer examination of the factors involved. An understanding of their significance could assist in defining the principles governing animal production at pasture.

Total grazing intake can be expressed as the product of an intake rate (g/hour) and grazing time (hours). Studies on these two components in relation to herbage availability are reported. Techniques and preliminary results are outlined.

II. EXPERIMENTAL

(a) Herbage Availability

Small pasture plots of 0.1 to 0.2 acre were prepared by grazing and mowing well in advance of the period of observations so that a wide range of herbage availability would be present for the grazing animals. Herbage availability was determined from open quadrats cut to ground level in the manner described by Willoughby (1959).

(b) Rate of Herbage Intake

Herbage intake was estimated from the weight change of sheep during a period of grazing (usually 1 hour). Sheep were harnessed for faecal and urine collection to prevent weight loss. Insensible weight losses were estimated from fully harnessed sheep which were not permitted to graze.

Grazing intake was measured for 1 hour on each of six days, using three sheep per treatment.

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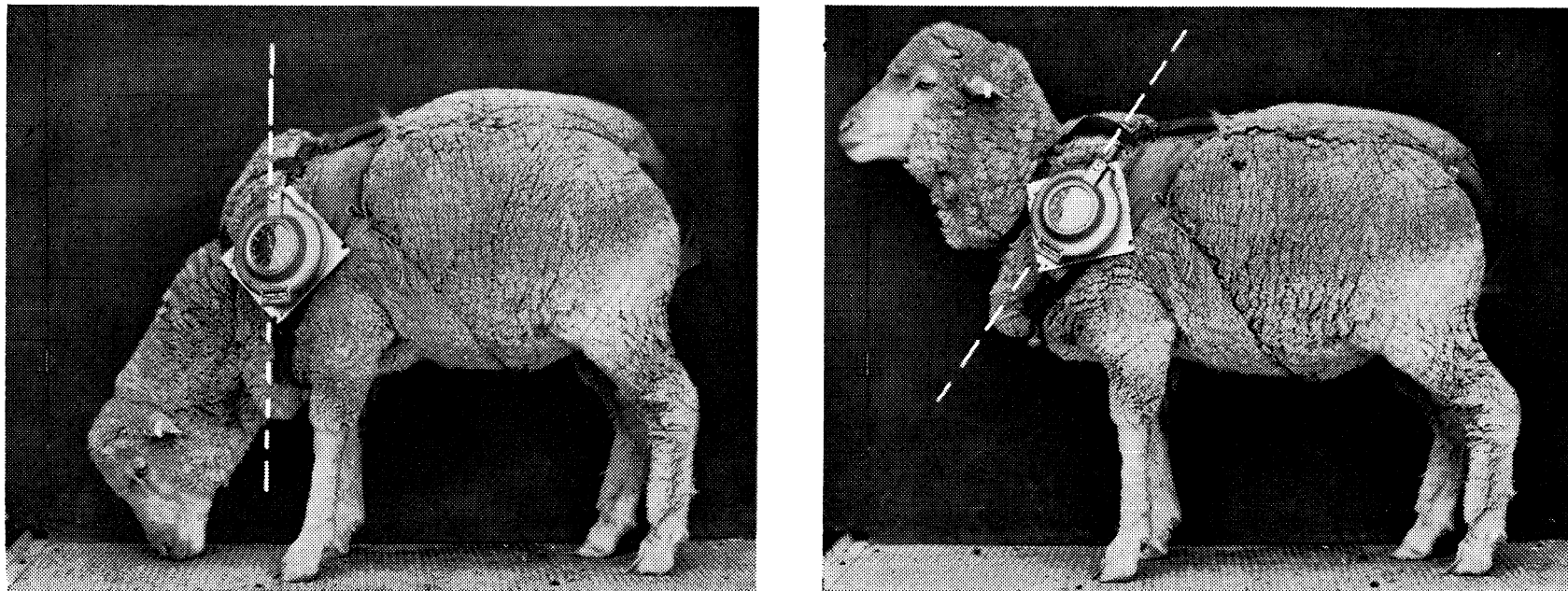


Plate 1.-The principle of operation of the vibracorder in measuring grazing time.

Left.-The pendulum records only when the clock is close to the vertical position.

Right.-When the head is raised the position of the recorder is changed, the pendulum is at rest, and no movement is recorded.

(The instrument normally carries a protective covering.)

(c) Estimation of Grazing Time

Grazing time was estimated from sheep continuously grazing plots of different herbage availability during two periods each of 9 days. The following method at pasture.

Total grazing intake can be expressed as the product of an intake rate was used: A vibracorder* was fitted to the neck of the grazing animal in such a way that the instrument was sensitive to movement only when the head of the animal was in the grazing position. The time and duration of grazing movements were recorded continuously. This technique has been applied only to sheep grazing grass-clover swards, and the results have shown that the properly adjusted vibracorder measures grazing time very accurately (Alden, unpublished data). Plate 1 shows the vibracorder fitted to a sheep. The instrument records movement only when the clock is in the vertical position, so it is probable that the instrument would be of little value for measuring grazing time on shrub pasture or on steep terrain.

III. RESULTS

The results of the initial studies extending over a period of four weeks on subterranean clover-ryegrass swards are shown in Fig. 1. At herbage availabilities greater than 3000 lb d.m./acre, both grazing time and rate of intake of green material were relatively constant. Below this value the rate of intake of green material decreased and grazing time increased. The moisture content of

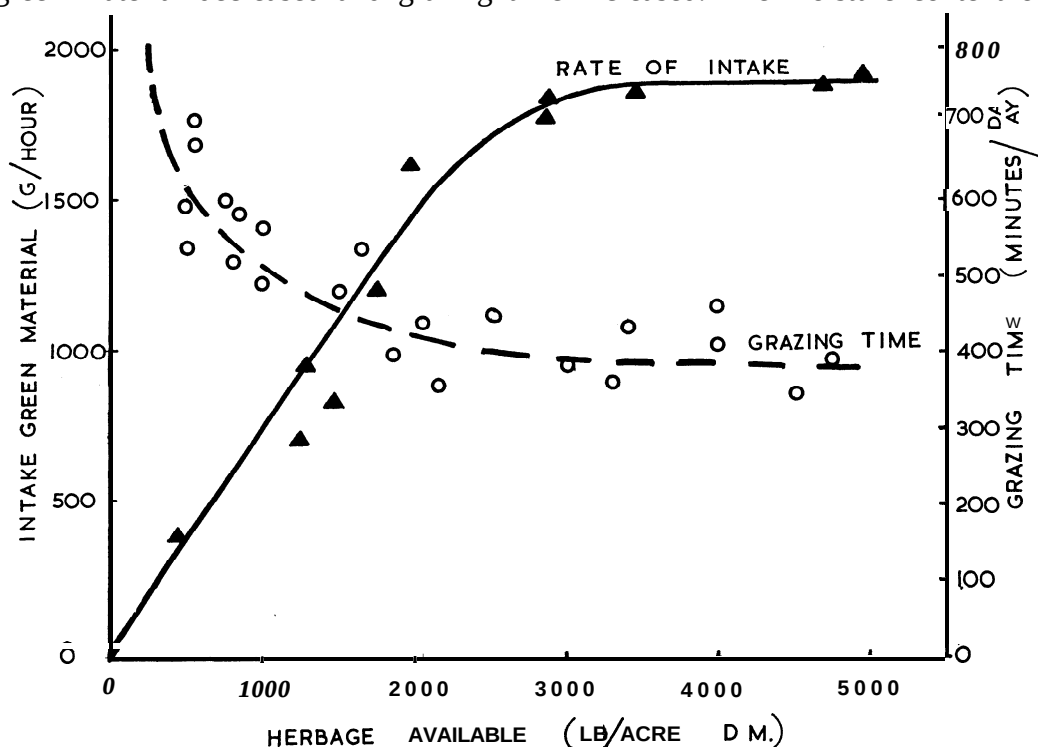


Fig. 1.-The relation of herbage availability to rate of intake, and to grazing time observed in the experiment. The response lines are fitted by eye.

* An instrument (manufactured commercially) that transmits movements by means of a freely oscillating pendulum attached to a stylus; this records distinctly the oscillations on a waxed paper chart, which is synchronized with a clock mechanism for continuous recording.

herbage sampled from the different plots showed a steady upward trend associated with increasing herbage availability. Using this crude measure it is estimated that the maximum rate of intake of dry matter occurred when the amount of herbage present exceeded 2000 lb d.m./acre.

IV. ACKNOWLEDGEMENT

The author wishes to thank Mr. D. Burns, Adelaide agent for Kienzle vibracorders, for lending instruments to us while the technique was being developed.

V. REFERENCES

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