

EQUIPMENT FOR MEASURING THE INTAKE OF MOLASSES BLOCKS BY INDIVIDUAL CATTLE WITHIN A GROUP

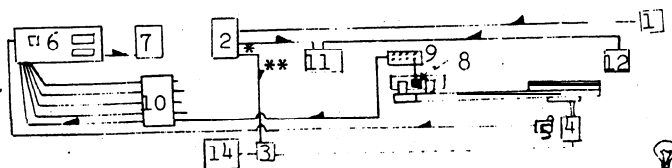
D. MACLEAN\* and G.R. PEARCE\*

Molasses blocks have commonly been used as carriers for urea and there has been interest in the inclusion of anthelmintics, anti-bloat agents and specific minerals such as magnesium. The major problem in their commercial adoption has been the variability in intake under different conditions. Few studies have been made of this variability and of means of overcoming or reducing it.

Equipment has been designed to permit the measurement of intake by individuals within a group of grazing cattle without 'interference with their normal behaviour patterns. A molasses block is suspended on a metal beam connected to a strain gauge# embedded in a special plastic strip. Changes in the weight of the block are monitored by the strain gauge, amplified through a Wheatstone bridge and recorded by a data logger with a digital printout on to paper tape. The system is actuated by means of a photoelectric cell so that when an animal approaches, the metal beam is released to record the initial weight of the block; when the animal leaves, the block is again weighed so that the difference in the weights is the intake by that animal. Individual animals are identified by means of a radio transmitter fitted around the neck, each animal emitting a different signal, which is recorded on tape co-ordinated with the photoelectric cell. The time of day is recorded by means of a digital clock also co-ordinated with the photo-electric cell permitting circadian behaviour to be analysed. Currently the equipment has been set up to record four units simultaneously but 10 channels are available for more comprehensive measurements.

Thus, intakes of individual cattle within a group can be measured with time-of-day behaviour. The recording equipment can be housed remote from the feeding location, which itself requires protection only for a bail width approximately two metres in length. Similar equipment that has been designed previously has been considerably less sensitive and has imposed much greater constraints upon the animals. This equipment can also be adapted to measure intakes of supplements other than molasses blocks. The circuitry is shown in the diagram below.

1. Photo-electric Cell
2. Timer
3. Solenoid/Air Valve
4. Air Cylinder/Support
5. Micro Switch
6. Data Logger
7. Printer
8. Strain gauge
9. Wheatstone bridge
10. 6-Channel Strain Amplifier
11. Tape Recorder
12. Radio
13. Molasses block Support.



14. Compressed air.  
 \*2 second timer  
 \*\* 10 second timer  
 — direction of electrical impulse  
 --- Air hose.

# A strain gauge is a variable resistor which measures dimensional change in an expandable matrix as the latter is subject to mechanical or thermal stresses, or a combination of both.

\* School of Agriculture and Forestry, University of Melbourne, Parkville, Victoria, 3052.