DIFFERENTIAL EXCRETION OF PHOSPHORUS BY BRAHMAN AND HEREFORD CATTLE

by
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With the cost of fertilizer increasing, more attention is being drawn to the utilization of phosphorus by stock. We have recently found an unusual circumstance when examining the urinary and faecal excretion of phosphorus by two different breeds of cattle.

Three Brahman and four Hereford heifers were held in pens and fed diets of lucerne chaff and crushed grain for a period of 6 weeks. The diet was calculated to maintain live weight (range 336 to 376 kg). Each day animals were fed 0.5 kg of corn and between 3.5 and 4.0 kg of lucerne. After this preliminary feeding period, animals were placed in metabolism cages and urine and faeces collected over 7 days during summer (mean 9a.m. R.H. 71%; mean max. daily temp. 33.5°C). The intake and excretion of phosphorus during that period is shown in Table 1.

<table>
<thead>
<tr>
<th>Breed</th>
<th>No.</th>
<th>Live Weight (kg)</th>
<th>Intake (g P/D)</th>
<th>Urine (g P/D)</th>
<th>Faeces (g P/D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BR</td>
<td>3</td>
<td>369</td>
<td>10.2 ± 0.2</td>
<td>0.36 ± 0.34</td>
<td>9.0 ± 0.7</td>
</tr>
<tr>
<td>HER</td>
<td>4</td>
<td>349</td>
<td>9.6 ± 0.2</td>
<td>3.3 ± 0.94</td>
<td>3.7 ± 0.4</td>
</tr>
</tbody>
</table>

Faecal excretion of phosphorus by the Brahman heifers was almost three times that of the Herefords (P < 0.01). To some extent this was offset by urinary excretion, however in both breeds there was less P in urine than in faeces. Only 0.36 g was excreted daily in Brahman urine. Rates of excretion were not related to rates of urine flow and the concentration of phosphorus in urine differed greatly in the two breeds. For Brahman and Hereford cattle respectively, urinary concentrations ranged from 2.5 to 46 mg/l. and from 183 to 712 mg/l. and faecal concentrations from 6.9 to 8.3 g/kg and from 2.9 to 4.4 g/kg. The digestibility of the ration was not significantly different between breeds (63.5 ± 1.5 (BR) v. 64.6 ± 1.3 (HER)). Similarly, phosphorus excretion could not be correlated with water or nitrogen intake as was found by Lomba et al (1969).

Breed differences in the partitioning of phosphorus between urine and faeces have not previously been described, although Vercoe (personal communication) has recently obtained results similar to those reported here. Meyer (1973) reported that three out of eight sheep in an experiment excreted over half their phosphorus output in the urine whereas the remainder excreted less than 1% by this means.

REFERENCES


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