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MINERAL SUPPLEMENTS FOR KIMBERLEY CATTLE

By W. M. NUNN, B.Sc. (Agric.), Officer-in-Charge, North-West Branch

For some years we have felt that in sections at least of the Kimberley cattle region, stock would benefit from a supplement of phosphorus. In his article "More Beef from the Kimberleys," which appeared in 1952 issues of this Journal, Cattle Adviser Grant A. Smith stressed this conviction and referred to trials which would be put in hand using American "Fosfeeder" equipment to meter the right amounts of soluble phosphate automatically into the trough along with the drinking water.

Responses by range cattle to phosphorus supplements have been marked in South Africa, and again in the United States. Many of the dairy cattle in this State are now fed a phosphorus supplement, and trials were therefore deemed highly desirable to test the matter under Kimberley conditions.

Organisation of these trials, unfortunately, turned out to be far more difficult than at first envisaged. Paddocks small enough to contain and control experimental groups of cattle, just don't exist on the Kimberley range, and we, of course, wanted them in particular regions where residual black soil is associated with limestone. Here the calcium-phosphorus ratio is characteristically high and evidence of phosphorus deficiency is all too frequently recorded among stock.

The real work of testing the value of phosphorus as a supplement is to commence this year in a series of paddocks now being constructed for the purpose by Emanuel Bros. at a site specially selected on Gogo Station at Fitzroy Crossing.
In the meantime, however, Mr. Smith has put his equipment to good demonstrational use in the Broome area and has obtained some results with a composite mineral supplement which are well worthy of publication at this stage.

In the vicinity of Broome is a large area of pastoral country which could be expected to produce prime cattle for the nearby meatworks. The annual rainfall increases from 20 in. south of Broome to over 25 in. in the north and there are considerable expanses of eucalypt savannah carrying a reasonable cover of natural grasses. Where buffel grass has been introduced this has grown vigorously.
Despite these advantages, however, the cattle produced in the area lack size and quality and, in consequence, there has been no attempt to utilise leases near Broome for the logical purpose of "topping off" cattle. Quite obviously some nutritional shortcoming has limited the productiveness of apparently lush pasture on this country.

CO-OPERATION

Convinced that mineral supplements would go a long way toward correcting the matter, Mr. Smith enlisted the co-operation of Mr. George Harris, of Roebuck Plains Station. Mr. Harris made available two paddocks, each of approximately 1,000 acres in area with separate watering points, together with the necessary cattle and mustering facilities.

It was the unusual circumstance of having two such paddocks available which determined the location of the trial, and it was a splendid example of enthusiasm and co-operation on the part of Mr. Harris that he should be prepared to allot these paddocks—his only paddocks at the time—to this particular cause.

The Department of Agriculture supplied a weighbridge and the Fosfeeder for mineralising the water supply of the supplemented group of cattle.

In September, 1955, the Animal Nutrition Officer (Dr. Snook), visited the area and reported that in his opinion the poor quality of the cattle was most likely to be due to copper deficiency. This opinion is supported by reports of "stringy" wool in Merino sheep and ataxia in lambs. Pasture and liver samples were collected from Roebuck Plains Station and these were found to be very deficient in copper. Dr. Snook commented on the absence of bone-chewing among cattle in the area inspected, despite the presence of bones around watering points. Bone-chewing is a characteristic habit among cattle suffering from phosphorus deficiency. Cobalt

![Image](image.png)

Fig. 3.—(Left) Control cow and calf photographed just prior to rains in February, 1957. (Right) Supplemented cow and calf photographed at same time. All cattle had been on dry feed for four months.

![Image](image.png)

Fig. 4.—(Left) Control cattle in February, 1957, after rains had commenced. (Right) Supplemented cattle at same time.
deficiency is to be expected in most coastal districts of Western Australia and Dr. Snook recommends that cobalt salts should be included in any mineral supplement fed to sheep and cattle in these areas.

Since we were obviously not equipped with paddocks and facilities to deal with several separate determinations, it was decided to run a single trial of one supplemented group versus one unsupplemented group and to include the three minerals copper, cobalt and phosphorus in the concentrate to be metered through the Fosfeeder into the trough, with automatic control from the ball tap.

Underlying the whole approach, of course, was the thought that if the minerals likely to be lacking in the natural feeds could be supplied by simple practical means via the water, which all stock must drink, then these areas in close proximity to the coast and existing meatworks, might be expected to play a more useful and prominent part in the general plan of Kimberley beef production.

The American Fosfeeder used was of rather elaborate and costly design, but a locally-produced mineral supplement metering valve is now on the market which does the job equally well and is available at a price which should ensure its ready sale.

Early plans for the demonstration were rather too ambitious. It was planned to start with breeding cows and to follow through over a period of years, rearing the calves in supplemented and unsupplemented groups after being weaned from their groups of 25 supplemented and 25 unsupplemented mothers. Willing as Mr. Harris was, however, at the planning stage, the task of controlling matings and weanings under relatively make-shift paddocking conditions on a drought-affected Kimberley range, was just impossible, and this part of the trial had to be abandoned despite a promising start.

Photographs are included however, of cows and calves from the two groups, and it will be obvious from these as it was from general appearance of the animals at all stages, that those drinking the “mineralised” water were deriving considerable benefit from it. Although detail concerning ages and weights are not available, it is probably quite significant that at the time of abandoning the trial the supplemented cows had reared 17 well-grown calves, while there were only nine—all relatively small—in the control group.

In November 1956, 106 steers between one and three years of age were mustered from different parts of the open range and drafted into two groups of 53 head. After being weighed these groups were placed, one in each of our two 1,000-acre paddocks—one on normal station water supply, the other on similar water with the supplement of copper, cobalt and phosphorus measured through the Fosfeeder.

At this stage our most important objective was to obtain an estimate of the weight gains which might be expected over one season, from a mob of range cattle introduced to paddock conditions in this country close to the meatworks.

Accordingly, it was decided to forego much of the information we would have liked to obtain in the form of monthly increases, progressive variations in blood phosphorus level, etc., and to disturb the cattle as little as possible between initial and final weighings.

Seasonal conditions were far from good during the six months duration of this trial. Dry conditions prevailed through to February, when the only rain of the season was received. Pastures were dry again by the end of March.

The average gain in weight per head within the supplemented group was 152 lb. between November 4 and May 15, against an average of only 48 lb. within the control group.

Table I sets out group weights and gains, and breaks the groups into subgroups by weight, for further comparison.

<p>| TABLE I |
|----------------|----------------|</p>
<table>
<thead>
<tr>
<th>Control</th>
<th>Supplemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average weight in lb. 4/11/56</td>
<td>550 599</td>
</tr>
<tr>
<td>Average weight in lb. 15/5/57</td>
<td>598 741</td>
</tr>
<tr>
<td>Average gain in lb.</td>
<td>48 152</td>
</tr>
<tr>
<td>Number of animals over 1,000 lb. at final weighing</td>
<td>4</td>
</tr>
<tr>
<td>Number between 500 lb. and 1,000 lb.</td>
<td>32 46</td>
</tr>
<tr>
<td>Number below 500 lb.</td>
<td>18 2</td>
</tr>
<tr>
<td>Total number in final weighing</td>
<td>50 52</td>
</tr>
</tbody>
</table>

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It can be clearly seen that the supplemented animals progressed far beyond those in the control group. Their average gain of 152 lb. per head over a six month period in a drought summer with green feed available for little over one month, is far beyond expectations, and it may be that a station placed, like Roebuck Plains, beside the meatworks, could give thought to the possibility of devoting suitable areas to the fattening of steers bred in more distant regions.

It was observed during the course of this demonstration, both with cows and steers, that the animals which received the mineral supplement spent considerably more time grazing than did the controls.

While control beasts camped down in the shade near the water, the supplemented animals grazed well out over the paddock. They seemed to enjoy eating, even when the pasture was at its driest.

There certainly seems to be a case for fitting the mineral supplement valve to waters in the Broome region. Copper in this instance, is probably the most important of the additives, but there are other sections of Kimberley a need for more phosphorus is indicated, and we hope that tests now being planned for several locations, will enable firm recommendations to be made.

AVON OATS YIELD 90 BUSHELS TO THE ACRE AT ESPERANCE

The W.A.-bred oat variety, Avon, yielded 89.8 bushels to the acre in an oat variety trial at the Esperance Plains Research Station. Fulmark, a new variety from the New South Wales Department of Agriculture gave the next highest yield with 76.6 bushels, the mid-season W.A.-bred variety, Dale, gave 62.8 bushels to the acre, and the late-maturing variety, Algerian, gave 53.4 bushels.

The land on which the trials were conducted had not been previously cropped to cereals, but had been under subterranean clover pasture for seven years.

Commenting upon this phenomenal yield, the Minister for Agriculture (Mr. L. F. Kelly), said that Avon oats had been particularly prolific under suitable conditions. The season had been exceptionally favourable to high yields, and the crops at the Research Station had taken full advantage of the heavy applications of superphosphate with copper and zinc together with the build-up of soil fertility resulting from the pasture period.

The land on which the trials were conducted had been cleared by rolling and burning in 1950 and was then fallowed. In 1951 it was sown with Bacchus Marsh subterranean clover and Wimmera ryegrass with 180 lb. of super-copper-zinc mixture to the acre. Since then it had received an annual topdressing with 150 lb. superphosphate to the acre. The pasture was ploughed in May, 1958, and the oat trials planted during the first week of June with an application of 180 lb. to the acre of super-copper-zinc.

Mr. Kelly said that Avon appeared to be a highly suitable variety for the Esperance area. A bulk trial of the same variety yielded 72 bushels to the acre despite some loss of grain through lodging.
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