

PHOSPHORUS DEFICIENCY IN CATTLE IN THE SEPIK PLAINS

By *J.H.G. Holmes, Formerly, D.P.I., Erap
Morobe Province

INTRODUCTION

It has been obvious from the beginning that the D.P.I. Sepik Plains Livestock Station, 'Urmo', was not good cattle country. This was partly due to the high temperature and humidity and the low quality pastures. However, the main limit on raising cattle is the lack of enough phosphorus, as was shown by Dr. J. Copland of the Veterinary Laboratory, Kila Kila.

If cattle production was to continue, it was essential to supplement (add to) the feed with a phosphorus lick. We used 'Ultraphos' which is made by I.C.I. However, a low level of production could be maintained by water buffalo without this addition (see Schottler, Boromana and Williams, 1977)

'Ultraphos' supplements in 1978 cost K5.50 per cow per year. Three trials were carried out between 1973 and 1978 to see if any other minerals were too low (deficient) and to see if the amount of 'Ultraphos' fed could be made smaller because it was so expensive.

TRIAL 1

This lasted three years. Heifers in groups of 20 were supplemented with either nothing, copper, cobalt, copper and cobalt or 'Ultraphos' (which contains phosphorus,

copper and cobalt). The group receiving 'Ultraphos' grew 0.27 kg per day, while all the others grew 0.06 kg per day. This showed that copper and cobalt were not too low in the normal diet.

When phosphorus-deficient cattle were given 'Ultraphos' after being without it for 15 months, they did not grow very quickly. Even two years later, they had not caught up with the heifers that had had phosphorus supplement all the time. The heifers which had not had supplements before did not breed as well, and their calves grew more slowly. This meant that phosphorus was necessary for growth, breeding and calf growth. If the heifers went without it for 15 months, they never recovered completely.

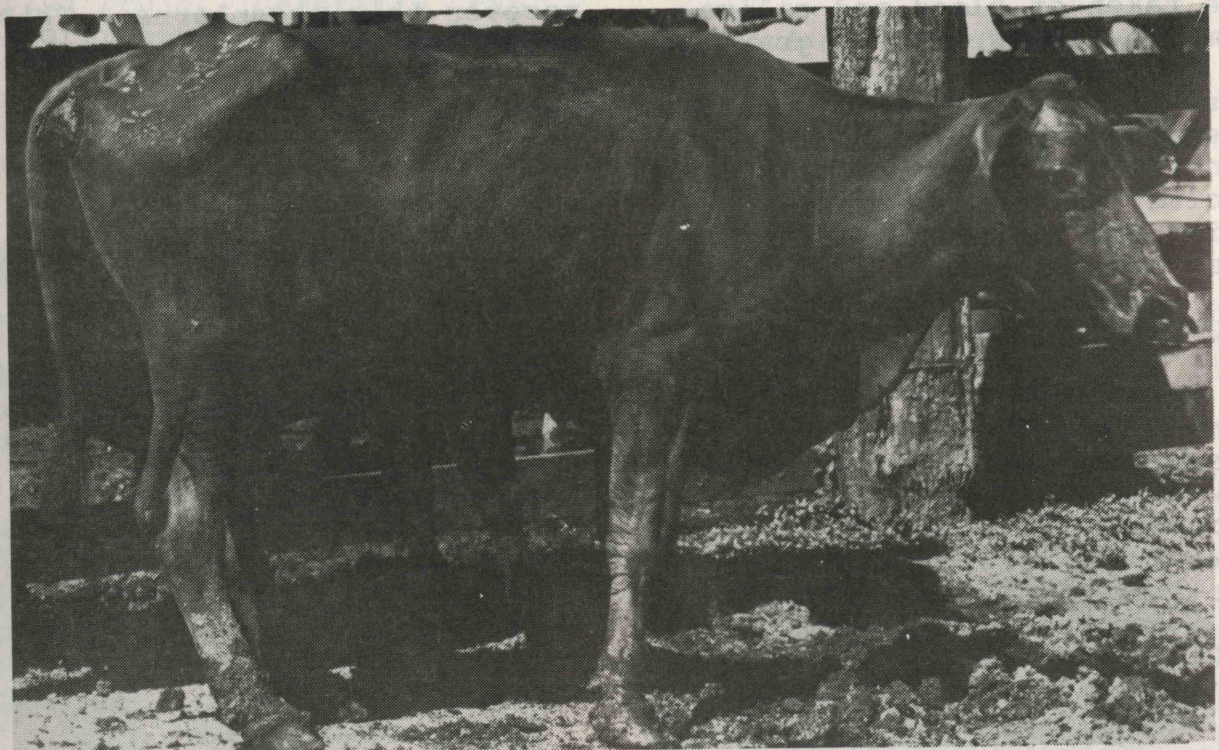
TRIAL 2

Four groups of 20 heifers were used. One group received no phosphorus. One group received all the phosphorus they would eat. One group received half as much as they would eat, and the fourth group received phosphorus in the dry season only. Table 1 shows that heifers receiving some phosphorus bred faster and had better weaning percentages.

*Present address: University of Melbourne, School of Agriculture and Forestry.

TABLE 1. RESPONSE OF CATTLE TO VARIOUS AMOUNTS OF PHOSPHORUS SUPPLEMENT IN TRIAL 2

	Amount of phosphorus supplement:			
	None	Unlimited	Half of unlimited	Unlimited in dry season
Number of blocks per cow per year	0	0.55	0.28	0.35
Cost, per cow per year	0	K5.50	K2.80	K3.50
Months till breeding	12	7	6	10
Weaning % over next two years	35%	55%	52%	52%
Growth of calves kg per day	0.23	0.37	0.30	0.35
Death of cows	20%	0%	30%	10%
Additional return	-	K14.50	K2.20	K8.90
Additional profit per cow per year	-	K9	-K0.60	K5.40



A typical phosphate-deficient cow. The signs are: the animal is not alert; bones sticking out; hollow flanks; rough, matted, coarse and discoloured coat; hindquarters hunched forward or 'tucked up'.

It also shows that growth of the calves was best in those taking unlimited phosphorus supplement. In all of the other groups some of the heifers died.

When we worked out the money gained by using phosphate supplements, the group receiving unlimited phosphorus supplement gave a far greater profit.

This shows that breeding stock should get all the phosphorus they will eat. Phosphorus is needed for bone growth and calves need a lot of phosphorus in the milk to help them to grow strong bones. If the cow does not have enough phosphorus in the feed, phosphorus from her own bones will go into the milk. Then the cow will have weak bones which may break easily, or she may die.

TRIAL 3

Twenty-two steers were grazed at Urimo for a year. Samples were taken of blood and saliya from the steers, and of grasses and legumes from the paddock, to see if there were any other mineral deficiencies. Minerals checked were copper, cobalt, calcium, magnesium, zinc, sodium and iodine: none of these was deficient.

CONCLUSION

The only mineral deficiency at Urimo is a deficiency of phosphorus. Deficient animals grew slowly and were slow to conceive. Their calves grew slowly, and some calves and cows died. Animals needed all the phosphorus supplement they could eat. They needed phosphorus supplement available at all times, not just now and again. This gave the best cow survival and breeding, calf growth and maximum profit.

HOW TO MAKE A SALT LICK

Phosphorus supplements can be made from bones of slaughtered cattle. The bones should be burnt over a hot fire. The bone ash crumbles easily and it can be ground by hand and mixed with salt. This makes a loose salt lick which can be fed in wooden troughs to cattle.

BONES ARE WORTH MONEY

The bones of a well-grown steer will weigh about 60-70 kg and contain 2.7-3 kg of phosphorus. This is the same as the amount of phosphorus in a 20 kg phosphorus salt block (these are usually about 15% phosphorus). So the bones of a steer, burnt, ground up and mixed with salt, are worth about K10. Only head and shin bones are available at an abattoir but the other bones could be recovered from the butchers. It may be worthwhile to put in an incinerator and hand crusher in association with Provincial abattoirs, to recover this phosphorus. This would reduce costly imports of phosphorus licks which have been difficult to obtain on a regular basis at Wewak.

FURTHER READING

Gohl, B. (1975). *Tropical Feeds*. F.A.O., Rome. pp. 409-410

Holmes, J.H.G. (1981). Phosphate deficiency in cattle on the Sepik Plains in Papua New Guinea. *Tropical Animal Health and Production* 13 (in press).

Schottler, J.H., Boromana, A. and Williams, W.T. (1977). Comparative performance of cattle and buffalo on the Sepik Plains, P.N.G. *Australian Journal of Experimental Agriculture and Animal Husbandry* 17, pp. 550-554