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Identifying and solving mineral deficiencies in sheep and goats in Inner Mongolia

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Key words : mineral deficiencies, sheep, goats, collaboration

Introduction Sheep and goat flocks in Alxa League exhibited sub-clinical health and production problems that could be a result of mineral deficiencies. Human iodine deficiency is known in Alxa. Soils and rangeland plants in parts of Alxa were known to be mineral deficient (GGERI, 1989). But no data were available relating to mineral deficiencies in small stock. The AusAID-funded Alxa League Environmental Rehabilitation and Management Project (ALERMP), managed by Cardno Acil, investigated mineral deficiencies in sheep and goats in 2005, and tested if mineral blocks were a practical remedy to the deficiencies indicated by the survey. The investigation was a demonstration of collaboration between stakeholders.

Materials and methods In March-April 2005, blood samples were collected by jugular venipuncture from 5 breeding females from each of 14 sheep flocks and 12 goat flocks across Alxa. Collected by PMO and Banner veterinary staff, the samples were analysed for minerals by atomic absorption spectrometry at the League Veterinary Laboratory. Collaborating farmers provided data on their stock numbers, winter feeding strategy and productivity. The University of Inner Mongolia (UIM) assisted in analysing the results. A mineral block was formulated by ALERMP to redress the imbalances indicated by the survey. Blocks were distributed free to collaborating farmers in autumn 2005, who kept records of livestock changes.

Results and discussion

Table 1 Indications of mineral deficiencies in ewes and nannies in Alxa League.

Mineral	Ca/P ratio	I	Mn	Se	Mo
Units	ratio	mg/L	mg/L	ug/L	ug/L
Sample size	126	130	130	130	130
Mean value	0.56	0.0025	0.008	33.6	0.016
S.D.	0.43	0	0.01	27.1	0.04
Normal value*	2	0.1-0.4	0.07-0.2	200-2000	n.a.

(* Underwood and Suttle, 1999)

The survey indicated deficiencies in Iodine, Manganese and Selenium, and probably Molybdenum. Calcium levels were low, consistent with feeding maize stalks. Other mineral levels appeared adequate, except Copper where adequacy appeared marginal. Sulphur levels were high. Farmers contributed insights into the changes following the introduction of the mineral supplements, including improved breeding performance, stronger lambs and kids, decreased incidence of urinary calculi and improved wool colour. Mineral blocks to increase lamb growth rates were found to be economical.

Conclusions Mineral blocks confirmed the survey indications of mineral deficiencies, and proved to be an economical way to increase sheep and goat productivity. However, an attractant in blocks other than salt is required where feed and/or water contain appreciable amounts of salt. New knowledge concerning the mineral nutrition of sheep and goats in Alxa League has been developed at reasonable cost through the collaboration between ALERMP, government bureaux, UIM and farmers.

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