Vet. Med. J. Giza, 39, No. 39, No. 3, 871-874 (1991)

SHEEP DISEASES CAUSED BY FEED MINERAL CONCENTRATIONS IMBALANCE IN INTENSIVE SHEEP PRODUCTION FARMS, CENTRAL SUDAN

BY

L.K. JAJA, O.M. MAHMOUD* AND E.M. HAROUN*

Faculty of Veterinary Science, University of Khartoum Sudan and * Faculty of Agriculture and Veterinary Medicine, P.O.Box 1482 Buraidah, Saudi Arabia.

(Received: 19. 5. 1991).

INTRODUCTION

Mineral excesses or deficiencies in sheep feed are known to result in serious diseases (Underwood,1981). In a previous report we showed that a deficiency of zinc in sheep feed could result from the low content of the mineral in the diet (Mahmoud et al., 1983)and its effect was worse when feed copper concentration was above normal (Mahmoud et al., 1985).

In this paper we report a seven years experience on sheep diseases that occurred in an intensive production farm which had a highly unbalanced mineral content in the grown feed. The animals were also fed on a concentrate diet to which calcium was the only added mineral.

MATERIAL AND METHODS

The farm in which the study was performed lies south of Khartoum and contained about 200 breeding ewes. Diseases were observed for a period of seven years and were diagnosed by clinical, postmortem and laboratory methods.

Minerals concentrations in the serum and feed were determined by the methods described in the Ministry of Agriculture, Fisheries and Food, Bulletion 73 (1974). Where bacteriological examination was required, samples were sent to the microbiology laboratory for identification by standard techniques.

RESULTS

The results of the mineral analysis of the green fodder (Sorghum spp.) is given in Table, 1.

Table 1. Mineral content of *Sorghum bicolor.*

Mineral	Cu ppm Dm	Zn ppm Dm	Mo ppm Dm	Se ppm Dm	S g/kg Dm	Ca %Dm	P %Dm
Mean + SD	13.6+3.2	24.4+3.6	1.2+0.2	0.1+.05	4.8+.8	0.36+0.12	.06+.02

The concentrate fodder was made of a mixture of 30% ground nut cakes, 40% grains, 22% fibre, 6% $CaCO_3$ and 2% salt. This was fed on a daily basis at 0.5 kg per day per ewe.

The diseases that we reported in the farm were:-

1. Zinc deficiency: Characterized by a low serum zinc of 3.2 + 1.1 u mol per litre and clinically by poor growth rate, skin lesions and hair loss.

2. Copper posisoning characterized by liver copper content of above 560 ppm and clinically by jaundice, anaemia and mortalities.

3. Lowered resistence to infection:

a. Abscessation of superfecial lymph nodes.
b. Non-specific diarrhoeas.
c. Progressive fatal pneumonia that was unresponsive to antibiotic treatment. Except for few cases of *P. haemolytica*, we were unable to isolate a specific pathogen from the infected animals.

DISCUSSION

The green fodder fed to the sheep had a normal molybdenum, sulphur, selenium and calcium content. Zinc concentration was low while copper concentration was high for it's requirement in sheep ration (National Academy of Science, 1975). Copper and calcium are antagonists to zinc absorption and such antagonism was worse by the low phosphorous concentration in the feed (Davies, 1979; Underwood, 1978). The resulting zinc deficiency might explain the lowered resistence to infection since Lymphocytes were known to contain 25 more zinc than any other cell in the body (White et al., 1978). Lymphocytes are the cells that are responsible for the immunity against infection. Suliman et al. (1989) reported a clinical syndrome in cattle characterized by pyrexia, death and low serum immunoglobulins. These animals were known to us as being brought to the zinc-deficient area and that their low serum immunoglobulins concentration might, at least in part, be caused by a deficiency in zinc.

Bone abnormality, diagnosed clinically as osteodystrophy fibrosa, could be attributed to the unbalanced Ca-p ratio. The condition was also observed in race horses in the same area (Shadad-personal communication) and characterized by lameness and increased incidence of bone fracture.

SUMMARY

Sheep fed on a green fodder containing low zinc, high copper, and low phosphorous content may develop serious diseases. When a concentrate ration containing high amount of Ca was given, mineral interaction was greater and the animals developed zinc deficiency, copper poisoning, immunological deficiency and/or bone abnormalities. Balancing the mineral content in sheep feed is essential for proper production and health.

REFERENCES

1. Davies, N.T. (1979): Anti-nutrient factors affecting mineral nutrition. Proc. Nut. Soc., 38, 121-128.

2. Mahmoud, O.M. Elsamani, F. Bakheit A.O. and Hassan M.A. (1983): Zinc deficiency in Sudanese desert sheep J. comp. Path, 93, 591-595.

3. Mahmoud O.M., Bakeit A.O. and Elsamani F. (1985): Treatment of Zinc deficiency by zinc injection. TEMA-5 Aberdeen UK,

4. Ministry of Agriculture, Fisheries and Food (1974): The Analysis of Agricultural Materials, Buletin (73).

5. National Academy of Sciences (1975): Nutrient Requirements of Domestic Animals. Nutrient Requirement of Sheep 5th edition, NAS, Washington.

6. Suliman, H.B., Bakheit, H.A. and Fagiri, I. (1989): A Clinical syndrome in imported cows subjected to environmental stress. The Vet. Rec. 12, 240.

7. Underwood, E.J. (1981): The Mineral Nutrition of Livestock. Common Agricultural Bureax- London.

8. Underwood, E.J. (1978): Interaction of trace Elementhes. In, Toxicity of Heavy Metals in the Environment. Edited By F.W. Ohme, PP 641-668 Marcel Dekker Inc. New York.

9. White, A., Handler, P., Smith E.L. Hill, R.L. and Lehman L.R. (1978): The Blood. In Principles of Biochemistry. 6th edit. mcGraw-Hill Inc. Tokyo.