

Trace Mineral Requirements/Toxicity in Sheep

A sheep producer had 800 whiteface ewes (170 lb body weight) lambing at the end of March. Ewes were in good condition at shearing (6 to 8 weeks before lambing), and then started losing body condition. At lambing the ewes had body condition scores of 1 to 1.5 (normal is 3 out of 1 to 5 scale). At lambing and shortly thereafter, ewes and lambs starting dying. Lambs died shortly after birth, or because the ewe couldn't deliver the lamb. The flock should have produced approximately 1,500 lambs, but 1,000 lambs died. A total of 300 ewes died. Ewes died either before giving birth, during lambing, or shortly thereafter. The diet the ewes were being fed consisted of 1 lb wheat screenings, 4 lb alfalfa hay, and a mineral supplement. The producer suspected a mineral toxicity of Fe, Cu, or Zn, and had the hay, grain and mineral supplement analyzed (Se toxicity had already been ruled out). The lab results are given below (all analyses are on a DM basis). Did a mineral toxicity cause the deaths? If so, how could they have been prevented? If not, what caused the deaths, and how could they have been prevented? Use your calculations to document your conclusions.

(From the feed tag) Feeding Directions of mineral mix: Feed in a dry, wind-free, rain-protected feeder. Free-choice intake should be 1/3 to 1 ounce per head daily.

Lab analysis of mineral mix

Analysis	Level
DM, %	100%
Sulfur, %	1.21
Phosphorus, %	11.46
Magnesium, %	5.00
Calcium, %	15.75
Iron, ppm	8,023
Manganese, ppm	7,021
Copper, ppm	35.0
Zinc, ppm	7,806
Molybdenum, ppm	8.3
Monensin (Rumensin), g/ton	0

Lab Analysis of Wheat Screenings

Analysis	Level
Dry matter, %	87.53
Crude protein, %	11.9
ADF, %	11.8
TDN, %	79.7
Sulfur, %	0.17
Phosphorus, %	0.40
Magnesium, %	0.22
Calcium, %	0.25
Iron, ppm	312
Manganese, ppm	59
Copper, ppm	9
Zinc, ppm	33

Lab Analysis of Alfalfa Hay

Analysis	Level
Dry matter, %	88.22
Crude protein, %	7.01
ADF, %	41.1
TDN, %	54.4
Sulfur, %	0.13
Phosphorus, %	0.11
Magnesium, %	0.20
Calcium, %	0.87
Iron, ppm	86
Manganese, ppm	26
Copper, ppm	5
Zinc, ppm	15