SELENIUM SUPPLEMENT FOR PASTURE

Tall fescue and quackgrass paddocks of 1.5-acre were grazed by five pregnant heifers. The heifers were rotated from one-half paddock to the other each 28 days. The paddocks were fertilized with ammonium sulfate at 80 pounds of N per acre and flood irrigated as necessary. The heifers were placed on pasture on July 16 and removed on October 6. A mineral supplement (Table 13) was supplied to each paddock at the rate of 1 ounce per head per day. Sodium selenite was added to the mineral supplement at 200 and 400 parts per million (ppm) selenium. Each grass by selenium treatment was replicated twice in a completely random design.

Heifers on quackgrass pastures demonstrated a linear rise in whole blood selenium from 0.05 to 0.16 ppm and from 0.05 to 0.25 ppm after 84 days of 200 and 400 ppm selenium mineral intake (Table 14). The blood selenium of tall fescue groups increased from 0.04 to 0.16 ppm and from 0.04 to 0.22 ppm after intake of 200 and 400 ppm selenium mineral. After 84 days on tall fescue pasture, heifers fed 400 ppm selenium mineral had significantly lower ($P<.08$) blood selenium content than equivalent heifers on quackgrass pasture.

The average daily gain (ADG) of heifers on unfertilized pastures was 1.62 pounds compared to 1.47 pounds on pastures fertilized at 150 pounds N per acre (Table 15). The ADG of heifers on quackgrass pasture was not different for the control or nitrogen fertilized groups. The ADG of heifers on nitrogen fertilized tall fescue was 83.1, 93.7, and 56.7 percent of the ADG on control fescue at 0, 200, and 400 ppm selenium

mineral rates. The weight gain of heifers on fertilized tall fescue was nearly half that of heifers on unfertilized pasture at 400 ppm selenium. The total alkaloid content of tall fescue pastures was 0.06 and 0.10 percent DM for control and 150 pounds nitrogen per acre, respectively. It appeared that some interaction of 400 ppm selenium mineral and the high alkaloid content of nitrogen fertilized tall fescue occurred to reduce cattle gain. This interaction between selenium and tall fescue was also observed in 1980 at the Klamath Experiment Station[2]. This interaction did not occur at the 200 ppm selenium mineral rate. For this reason selenium mineral supplement should not contain more than 200 ppm selenium when fed to cattle on tall fescue pasture.

Table 13. Hi-Phos, Hi-Copper Mineral Supplement for Klamath, Oregon, Area

Guaranteed Analysis		
Ash	(Max.)	65.000%
Calcium (CA)	(Min.)	8.000%
Calcium (CA)	(Max.)	9.000%
Phosphorus (P)	(Min.)	13.000%
Magnesium (g)	(Min.)	0.015%
Iron (FE)	(Min.)	0.250%
Cobalt	(Min.)	0.004%
Manganese (Mn)	(Min.)	0.080%
Copper (CU)	(Min.)	0.500%
Zinc (ZN)	(Min.)	0.400%
Iodine (I)	(Min.)	0.000%
Salt (NaCL)	(Min.)	4.500%
Salt (NaCL)	(Min.)	5.500%
Vitamin A	(Min.)	20,000 USP Units/lb
Vitamin D3	(Min.)	5,000 USP Units/lb

[2] Buettner, M.R. 1981. Hay and pasture research in the Klamath Basin, Oregon 1980. Oregon Agriculture Experiment Station Special Report No. 635.

Table 14. The whole blood selenium levels of heifers fed selenium mineral on pasture, 1981

Grass	N	Se	days on pasture		
			0	56	84
	lb/A	ppm	ppm Se		
Quackgrass	0	0	0.05	0.07	0.05
		400	0.06	0.14	0.22
	150	0	0.05	0.07	0.05
		200	0.06	0.13	0.16
		400	0.05	0.19	0.27
Tall fescue	0	0	0.04	0.06	0.04
		200	0.04	0.12	0.16
		400	0.04	0.15	0.21
	150	0	0.03	0.06	0.04
		200	0.03	0.13	0.17
		400	0.04	0.16	0.22
$LSD_{(.05)}$			0.02	0.02	0.02
CV			21.5%	8.70%	6.92%
P(F)			14.6%	5.83%	8.15%

Table 15. The average daily gain of heifers fed selenium mineral on pasture, 1981

Grass	N	Mineral Se content, ppm			Total Alkaloid
		0	200	400	
	lb/A	lb/hd/day			%
Quackgrass	0	1.01	-	1.64	0.00
	150	0.99	1.49	1.86	0.00
Tall fescue	0	1.66	2.06	2.01	0.06
	150	1.38	1.93	1.14	0.10
$LSD_{(.05)}$		0.42			
CV		30.5%			
P(F)		5.19%			