

BLOOD TRACE ELEMENT AND VITAMIN LEVELS OF ALPACAS

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Trace element and vitamin responsive disorders in livestock are of economic importance in southern Australia. This study was undertaken to determine trace element and vitamin concentrations in blood of alpacas at pasture in this region.

Blood samples for blood selenium, plasma copper and zinc and plasma vitamins B₁₂, E and A assay were collected from 20-30 female alpacas (Huacaya) at each of 2 sites in South Australia (SA1 and SA2) and 2 in Victoria (V1 and V2) on 4 occasions (Nov. 1994 and Feb., June and Aug., 1995). Alpacas selected for sampling were from 4 age groups, viz: cria (< 6 months of age), weaners (6- 12 months), tuis (12-24 months) and adults (>24 months). The alpacas at site V2 had access to commercial alpaca pellets containing trace elements. A linear model was fitted to the data and included the effects of site, animals nested within site, age, sampling time and 2-way interactions.

There was a significant site by time of sampling interaction ($P < 0.01$) for all constituents and an age effect for copper ($P < 0.001$), selenium ($P < 0.001$) and vitamin E ($P < 0.05$). Copper values increased with age, selenium values were lower in cria and weaners than in the older alpacas, and vitamin E concentrations were lower in weaners than in cria. Table 1 gives a summary of the effect of time of sampling on blood constituents: only plasma zinc and blood selenium were affected at all sites.

Table 1. Least square mean values for blood and plasma constituents collected on 4 occasions from alpacas at 4 sites (SA1, SA2, V1, V2)

	Nov.	Feb.	June	Aug.	Nov.	Feb.	June	Aug.
	Plasma zinc, $\mu\text{mol/L}$				Plasma copper, $\mu\text{mol/L}$			
SA1	5.8c	3.2a	4.5b	5.5c	8.1a	8.2ab	7.9a	9.6b
SA2	3.7a	6.0c	4.7b	4.1ab	8.3a	7.9a	7.5a	7.2a
V1	3.8a	3.6a	4.5b	4.9b	8.1a	7.5a	8.3a	9.1a
V2	4.8bc	3.0a	4.3b	4.9c	7.9a	9.1b	8.0ab	8.0ab
	Blood selenium, $\mu\text{mol/L}$				Plasma vitamin E, mg/L			
SA1	1.3ab	1.3ab	1.5b	1.0a	2.4a	1.7a	2.1a	1.8a
SA2	1.2a	2.5b	2.8b	2.6b	2.0a	1.9a	1.5a	1.1a
V1	0.5a	0.7ab	0.9b	0.7ab	2.4a	3.6b	2.9ab	1.9a
V2	2.3b	1.9a	2.1ab	2.2b	2.9a	5.2c	3.7b	3.5ab
	Log_{10} plasma vitamin B ₁₂ , pmol/L				Plasma vitamin A, mg/L			
SA1	2.36b	2.39b	2.12a	2.50b	1.2a	1.2a	1.2a	1.2a
SA2	2.39ab	2.25ab	2.49b	2.20a	1.1a	1.5b	1.2ab	1.2a
V1	2.41a	2.38a	2.30a	2.35a	1.0a	1.1ab	1.3b	1.0a
V2	2.49a	2.49a	2.48a	2.55a	1.0a	1.5c	1.3b	1.3b

Different alphabetical notation within rows denotes a significant difference ($P < 0.05$).

Note the low plasma zinc concentrations in Table 1. Values above 9 $\mu\text{mol/L}$ are usually indicative of adequate zinc status for sheep and cattle. This study was supported by a grant from the Rural Industries and Development Corporation.