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COBALT DEFICIENCY AND HELMINTH INFECTION IN GRAZING SHEEP

D.G. MASTERS, K.A. STREET and J.D. DUNSMORE*

Cobalt (Co) deficiency can impair the immune function of sheep (Paterson and MacPherson 1990) and this may increase vulnerability to helminth infection (MacPherson et al 1987). Co deficient soils are found in many Australian agricultural areas. Helminth infection is also a widespread problem causing both production losses and increased costs.

The aim of this experiment was to examine the interaction between Co nutrition and helminth infection on weaner sheep in a mediterranean environment. Four treatments were applied to 100, 10 week old weaners in a factorial design. Factors were + or - Drench (D) and + or - Co (Co bullet at the start of the experiment). Each month the sheep were weighed, blood and faeces collected, a dyeband applied to the skin surface (for measurement of wool growth) and D was administered (Ivermectin 0.2 mg/kg). The number of *Trichostrongolus/Ostertagia* eggs in faeces were counted using the McMaster flotation chamber technique. The experiment started in September and finished at shearing in March .

Treatment		Live weight			Clean wool growth			Faecal egg counts		
Co	D	Sep	Dec (Kgs)	Feb	Fleece (Kgs)	Spring (g/day)	Summer	Sep	Dec (eggs/g)	Feb
-	-	28.7	34.9	30.0	1.6	8.0	3.3	330	497	1163
-	+	28.6	36.0	32.2	1.8	8.9	3.9	207	101	0
+	-	28.6	37.5	30.5	1.6	8.6	3.2	477	45	809
+	+	28.3	39.0	34.1	1.9	10.0	3.9	410	53	0
Main effects$_{P<0.05}$		n.s	Co	D	D	D	D	n.s	Co	CoxD
L.S.D$_{P<0.05}$		2.2	1.6	1.5	0.2	1.0	0.5	8.8*	8.8*	2.6*

*L.S.D of square root of means.

The vitamin B_{12} concentrations in plasma (measured by the microbial technique using *Euglena gracillus*) were between 300 and 350 ng/L at the start of the experiment. These increased with Co supplementation and also increased in untreated weaners during summer, but were not affected by D.

There was a significant treatment effect on egg counts with less eggs in the Co treated sheep after the first 3 months and a Co x D interaction in the second 3 months. Live weights increased with the Co treatment for the first three months and with D during the summer months. Drench increased spring and summer wool growth. This resulted in a significant effect of D on clean fleece weights. Although the Co supplemented weaners had lower egg counts, these sheep still responded to D, in fact, the trend in both wool and live weight suggested that Co increased the responsiveness to D. This would not be expected if Co alone was acting to depress helminth infection.

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CSIRO Division of Animal Production, Private Bag P.O. Wembley, WA, 6014

* School of Veterinary Studies, Murdoch University, Murdoch, WA, 6150