THE EFFECT OF SALINOMYCIN ON RUMEN PROTOZOAL NUMBERS AND SELENIUM RETENTION IN SHEEP

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Monensin and narasin supplementation increases whole-body retention of selenium in cattle (Costa et al. 1985). Monensin also increases copper availability by decreasing protozoal numbers in the rumen of refaunated sheep (Ivan 1989). Dayrell et al. (1992) showed that the presence of protozoa in refaunated sheep decreases selenium retention in liver, kidney cortex and spleen. In both studies, the refaunated sheep originated from fauna-free stock. This paper reports the effects of the ionophore, salinomycin, on rumen protozoal numbers and the apparent retention of selenium in some tissues of "normally" faunated sheep.

There are two experiments reported here. In each experiment, eight Merino sheep were allocated to either an untreated or salinomycin group and feed once per day on oaten hay and sheep pellets. Salinomycin was administered orally to the sheep on daily basis, one hour before feeding. In the first experiment, rumen samples were collected at weekly intervals, five hours after feeding, and the protozoal numbers counted. In experiment two, another eight Merino sheep were each given on oral dose of 30μCi of $Na_2{}^{75}SeO_3$, 21 days after commencement of salinomycin supplementation. The sheep were necropsied 28 days later. The total weight of each organ was recorded and samples counted for radioactivity.

Salinomycin supplementation significantly decreased ($P<0.05$) rumen protozoal numbers within seven days, and protozoal numbers were significantly depressed ($P<0.01$) throughout the 35 days of sampling (Table 1). Salinomycin supplementation significantly ($P<0.05$) increased the retention of ^{75}Se in kidney and muscle, but not in liver (Table 1). Total muscle weight was estimated as 25% of the liveweight of each sheep.

Table 1. Mean rumen protozoal numbers (x 10^6/ml) and apparent retention of ^{75}Se (% dose/organ) in tissues of sheep either supplemented with salinomycin or left untreated

Treatment	Day 0	Day 7	Day 21	Day 35
Untreated	2.96 ± 0.97	2.35 ± 1.36	3.63 ± 1.46	2.98 ± 1.38
Salinomycin	3.56 ± 1.35	1.15 ± 0.61*	0.48 ± 0.16**	0.97 ± 0.37**

Treatment	Kidney	Liver	Muscle
Untreated	0.03 ± 0.01	1.09 ± 0.31	0.86 ± 0.27
Salinomycin	0.17 ± 0.04*	1.00 ± 0.08	1.51 ± 0.13*

Results are means ± SEM of four sheep. * $P<0.05$ ** $P<0.01$

Salinomycin can both decrease protozoal numbers and increase retention of selenium in kidney and muscle of sheep that have not originated from fauna-free stock. We propose that these two effects of salinomycin are related and consequential.

COSTA, N.D., GLEED, P.T., SANSOM, B.F., SYMONDS, H.W. and ALLEN, W.M. (1985). In "Trace Elements in Man and Animals - TEMA5", p. 472-474, eds C.F. Mills, I. Bremner and J.K. Chesters. (Commonwealth Agricultural Bureaux: Slough, UK).

DAYRELL, M. de S., IVAN, M. and HIDIROGLOU, M. (1991). Can. J. Anim. Sci. 71: 1269.

IVAN, M. (1989). J. Anim. Sci. 67: 3028.

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