

SELENIUM CONCENTRATIONS IN SOUTH AUSTRALIA WHEAT AND BARLEY

P. J. BABIDGE*

Wheat and barley crops were surveyed for selenium content to determine typical values for South Australian grain for livestock consumption,

The S.A. Barley and Wheat Boards routinely sample each load of grain delivered to silos. These samples are then pooled and mixed to provide a representative bulk sample for each silo. Barley samples from 100 silos (1981,1982) and wheat samples from 107 silos (1981) were provided by the S.A. Barley and Wheat Boards respectively. Each sample was powdered in a Rocklab stainless steel ring grinder and an aliquot analysed for selenium by a fluorimetric method (Koh and Benson 1983). A standard reference material from the National Bureau of Standards, USA (NBS 1571 Orchard Leaves) was included in each batch of assays. The results were expressed in umol/kg and were not corrected for moisture content. The results were not normally (although similarly) distributed and were therefore analysed statistically using a Kruskal-Wallis one way analysis of variance. Median rather than mean values are reported for the same reason.

Results of selenium assays were grouped into five regions of the state. A summary of results is shown in Table 1. There were significant ($P<.001$) differences between regions. Wheat and barley showed the same regional trends although wheat contained significantly higher ($P<.05$) levels of selenium than barley. Selenium levels in barley in 1982 were not significantly different from 1981 apart from in the South East region.

Table 1 Median and range of selenium concentrations (umol/kg) in wheat and barley from different regions of South Australia

Region	No. Samples	Barley 81	Wheat 81	Barley 82
Central	34-42	1.3 (0.6-2.8)	1.8 (0.9-2.9)	1.5 (0.7-2.5)
Lower Eyre	15-17	1.7 (0.6-2.8)	2.1 (0.7-3.4)	1.7 (0.6-2.6)
Upper Eyre	15-18	2.2 (0.9-3.0)	2.9 (1.5-4.0)	2.4 (1.2-3.5)
Murraylands	21-25	2.0 (0.6-2.9)	2.5 (1.7-3.7)	2.1 (1.4-3.0)
South East	8-11	0.5 (0.4-1.9)	1.5 (0.6-3.1)	1.0 (0.7-2.5)

To convert umol/kg to mg/kg divide by 12.67

The suggested dietary requirement of selenium for ruminants and poultry is 0.6 umol/kg (Levander 1986) and for pigs 1.9 umol/kg feed (CSIRO 1987). On this basis 6% of the 1981 barley samples did not meet requirements of ruminants or poultry while 61% of 1981 barley, 30% of 1981 wheat and 54% of 1982 barley samples did not meet requirement of pigs.

CSIRO (1987) - "Feeding Standards for Australian Livestock. Pigs". (CSIRO: East Melbourne).

KOH, T-S. and BENSON, T.H. (1983). J. Assoc. Off. Anal. Chem. 66:918.

LEVANDER, O.A. (1986). In "Trace Elements in Human and Animal Nutrition - Fifth Edition", Vol. 2, p.209, editor W. Mertz. (Academic Press: London).

* Central Veterinary Laboratories, Dept Agriculture, IMVS Building, Frome Rd., Adelaide, S.A. 5000.