

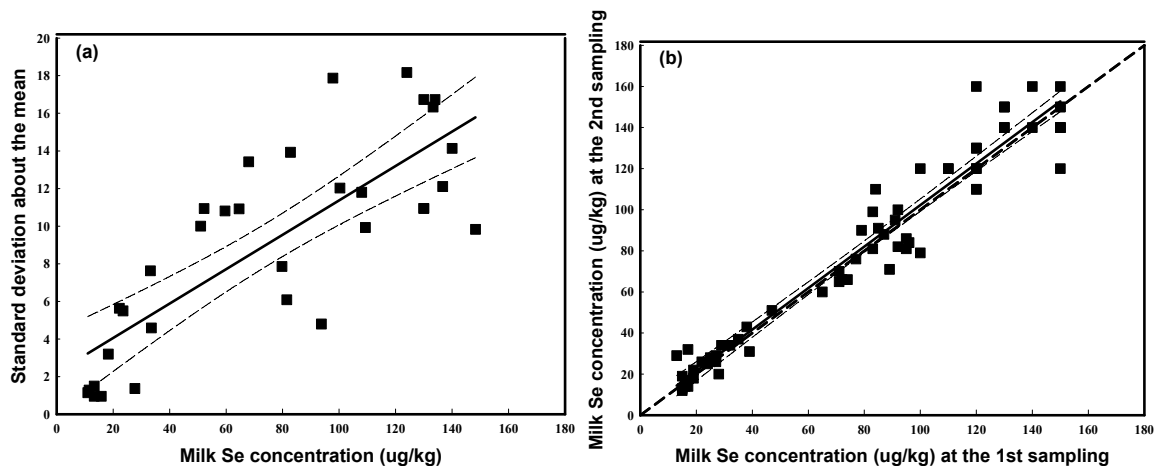
## Variability in Milk Selenium Concentration in Dairy Cows fed Selenium-Enriched Cereal Grain-Based Supplements

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Several studies have demonstrated the importance of selenium (Se) in human nutrition, and providing supra-nutritional levels of Se has been linked to decreased incidences of cancer, heart disease and arthritis (Rayman 2000). Elevated Se concentrations in milk from dairy cows can be obtained by supplementing diets with organic Se yeast (Heard *et al.* 2007). Providing cows have a consistent intake of Se, their milk Se should also be consistent, but it is unclear what variation actually exists within and between cows consuming the same amount of Se.

Heard *et al.* (2007) fed low- or high-Se rolled triticale at 4 kg DM/d, and 5 quantities of Se yeast (0-16 mg Se/d) carried in 1 kg DM/d of low-Se triticale pellets to 60 cows in both spring and autumn (6 cows per treatment). A combined p.m./a.m. milk sample was taken from each cow in the middle and at the end of each 6-week period of feeding. Total milk Se concentrations were determined using the technique described by Stockdale *et al.* (2008; this conference) for the analysis of Se in feeds. Results of the assays were analysed by regression analysis of repeated measures of samples against each other, and cows within groups were ranked according to milk concentration at each time, and group standard deviations were calculated.



**Figure 1.** Correlations between a) standard deviations about group means and milk selenium (Se) concentrations, and b) Se concentrations in the milk of individual cows measured in the middle and at the end of 6-week feeding periods in the research of Heard *et al.* (2007). The full lines are the curves of best fit, and the thin broken lines represent the 95% confidence intervals about this curve. The thicker broken line in Fig. 1b extending to the axes is the 1:1 line.

There was a large amount of variation between cows in feeding treatments, as seen by the graph of standard deviations in Figure 1a (CV averaged 13.1%). However, in each group of 6 cows, there was a tendency for rankings between cows to remain similar at the different sampling times. The cow with the highest milk Se concentration was ranked at the top at both sampling times in 5 out of 12 instances, and the bottom ranked cow was bottom in 7 instances. The correlation between 68 milk Se concentrations at the 2 times of sampling was 0.97 (CV = 14.0%; Figure 1b), with variation between times increasing as milk Se concentration increased. These results indicate that, while there is considerable variation in milk Se concentration between cows when they are fed consistent diets, this seems to be a cow effect rather than a diet effect because individual cows tended to be consistent in their response to the feeding of Se.

Heard, J.W., Stockdale, C.R., Walker, G.P., Leddin, C.M., Dunshea, F.R., McIntosh, G.H., Shields, P.M., McKenna, A., Young, G.P. and Doyle, P.T. (2007). *J. Dairy Sci.* **90**: 4117.

Rayman, M.P. (2000). *Lancet* **356**: 233-241.

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