

Title Selenium distribution in wheat grain, and the effect of postharvest processing on wheat selenium content

Author Graham H. Lyons, Yusuf Genc, James C. R. Stangoulis, Lyndon T. Palmer and Robin D. Graham

Citation Biological Trace Element Research 103 (2); 155-168. 2005.

Keywords wheat; distribution; processing; milling

Abstract

Selenium (Se) is an essential micronutrient for animals and humans, and wheat is a major dietary source of this element. It is important that postharvest processing losses of grain Se are minimized. This study, using grain dissection, milling with a Quadrumat mill, and baking and toasting studies, investigated the distribution of Se and other mineral nutrients in wheat grain and the effect of postharvest processing on their retention. The dissection study, although showing Se concentration to be highest in the embryo, confirmed (along with the milling study) previous findings that Se (which occurs mostly as selenomethionine in wheat grain) and S are more evenly distributed throughout the grain when compared to other mineral nutrients, and hence, lower proportions are removed in the milling residue. Postmilling processing did not affect Se concentration or content of wheat products in this study.

No genotypic variability was observed for grain distribution of Se in the dissection and milling studies, in contrast to Cu, Fe., Mn, and Zn. This variability could be exploited in breeding for higher proportions of these nutrients in the endosperm to make white flour more nutritious. Further research could include grain dissection and milling studies using larger numbers of cultivars that have been grown together and a flour, extraction rate of around 70%