

Selenium in the agricultural soils of East Anglia, UK

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The importance of selenium in human and animal health is already widely recognised, and targeted studies have been undertaken in many areas of chronic deficiency problems, as well as those of selenosis (excess selenium). One of the most important sources of selenium in the human diet is thought to be from cereal grain, particularly via bread intake.

Recent improvements in analytical methods permit the routine analysis of large numbers of samples for total selenium in soils, allowing large systematic surveys to include this analyte. Thus a recently released dataset, from the British Geological Survey's Geochemical Baseline Survey of the Environment (G-BASE), of selenium in soils from an important agricultural area of the UK has been studied. In addition to selenium, the dataset of 5,700 soil samples collected over an area of 11,400 km², has a comprehensive suite of inorganic chemical parameters, and a suite of physical properties and field observations. These ancillary data have been used to indicate the likely mobility of selenium from these soils, as well as to categorise the data by the detailed agricultural land use from which the soil sample was collected (e.g. cereal growing, market gardening, cattle grazing).

The data show that whilst the selenium concentration range is large (maximum of 9.5 mg/kg), the major cereal growing areas have what can be considered relatively low concentrations (median of 0.3 mg/kg), and that these are predicted to be of low mobility as well (based on other parameters such as calcium concentrations, pH, soil organic matter). Areas dominated by non-cereal growing have slightly higher selenium concentrations, particularly over the very organic-rich Fenland soils.