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Soil, wheat, cabbage and drinking water iodine in relation to human iodine status and iodine deficiency disorders in Xinjiang Province, China

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Iodine is an essential trace element for humans and animals. A lack in the diet can lead to iodine deficiency disorders (IDD) the most common manifestation being goitre, an enlargement of the thyroid gland in the neck. Infants born to severely I-deficient mothers may suffer cretinism and I-deficiency is the world's most common cause of preventable mental retardation. In many countries this problem has been tackled successfully using medical interventions such as the iodination of table salt. Xinjiang Province in northwest China is a remote desert region where goitre and cretinism have been reported for many years. People in this region do not like the taste of iodised salt and prefer to use local rock-salt with very low concentrations of iodine. As an alternative treatment, previous investigators added potassium-iodate to irrigation waters in an attempt to increase the I-concentrations of crops and animals in the food supply and the I-status of the population. Initial successes were reported but the long-term effectiveness of the method had not been tested. The present study aims to assess environmental controls on iodine uptake into the food chain and in Xinjiang had the opportunity to study three contrasting areas:

Area 1 - a region where goitre occurred historically (20% prevalence rate) but not in the last 20 years and the population use iodised salt

Area 2 – a region with high goitre prevalence (40%); a lack of iodised salt uptake and no iodine irrigation intervention

Area 3 – a region with high goitre prevalence (60%); a lack of iodised salt uptake and iodine irrigation intervention

The results from 15 villages, 5 in each of the three areas will be presented. Chemical differences in the environment (measured in soil, crops and drinking water) and the I-status of the human population (demonstrated by ultrasound thyroid volume, TSH and T4 spot-test blood analyses and urinary iodine concentrations from children) will be discussed.