

THE OCCURRENCE OF ARSENIC IN GREEN SALAD VEGETABLES

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The investigation had for its purpose the determination of the amounts of As_2O_3 found on head lettuce, cabbage, and spinach, presumably left as residues from arsenical sprays used on the growing plants. Modified Gutzeit method¹ for the determination of arsenic was employed and standard stains were prepared by this method representing from 0.02 to 0.5 mg of As_2O_3 . These stains were for the purpose of comparison with stains similarly produced by the unknowns. All reagents employed in all determinations were tested by the qualitative Gutzeit method and only those found to be arsenic free were used.

The vegetables examined included all parts as purchased at the market. They were first shredded then partially dried in six inch evaporating dishes over a hot plate. The material was then transferred to 800 ml Kjeldahl flasks and 10 g of $KHSO_4$, 6 ml of 0.1 molar $Cu SO_4$ and 50 ml of concentrated $H_2 SO_4$ added.

The vegetable was digested until all carbon was oxidized, then the liquid was diluted with water, cooled and made up to a volume of 0.5 l. An aliquot was transferred to the standard Gutzeit apparatus and the determination made. As a check a 50 g sample of sucrose was likewise digested, diluted and an aliquot run in the same apparatus. The latter showed that the reagents were arsenic free, and that the method was dependable.

Ten heads of lettuce having an average weight of 350.8 g showed the presence of from 0.15 to 0.375 mg of As_2O_3 , with an average amount of 0.2675 mg or 0.7 mg per kg of vegetable. Four heads of cabbage having an average weight of 505.9 g contained from 0.25 to 0.375 mg of As_2O_3 , an average of 0.325 mg, or 0.6 mg per kg. Four samples of spinach with an average weight of 258 g contained from 0.20 to 0.50 mg of As_2O_3 with an average of 0.319 mg or 1.2 mg per kg.

According to a report from the New Hampshire Agricultural Experiment Station,² the dangerous dose of As_2O_3 is 60 mg and the minimum recorded fatal dose is 130 mg. It appears, then, that the amounts of arsenic found in the salad vegetables tested are not sufficiently great to constitute a serious immediate menace.

¹ Scott, Wilfred. Standard Methods of Chemical Analysis, Vol. I (4th edition) pp. 46-52. D. VanNostrand and Co., New York.

² N. H. Agr. Exp. Sta. Bul. 183, p. 24, June, 1917.