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MONITORING FOR NITRATES IN VEGETABLES AND POTABLE WATER

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It is of common knowledge that most NO_3^- ions are derived from vegetable products, largely grown in private farms and not subjected to systemic monitoring. Potable water becomes another source, especially if water supply is decentralized. This survey purports to estimate the nitrite and nitrate content in vegetable products and potable water in different regions of Ukraine. Potatoes, carrots, red beets, and other vegetables were sampled, grown on indoor and outdoor beds, as well as potable water from private housing areas and urban utilities. Besides, nitrates were monitored in non-permanent consumption vegetables: Napa cabbages, Yalta sweet onions, squashes (autumn harvest), tomatoes and paprika (produced in Turkey), etc., as well as in pre-cooked frozen suilluses and bay boletes.

Nitrate content in vegetables was detected by potentiometric method, using an ion selective NO_3^- electrode.

Nitrates in potable water were detected by photometry using salicylic acid. The method is based on inter-reaction between nitrate ions and salicylic acid, producing mixtures of 3- and 5-anilotic acid which, in alkaline media, render yellow coloring. Light absorption was measured using photoelectric colorimeter with $\lambda = 490 \text{ nm}$, in a cuvette with $l = 2 \text{ cm}$.

Significant differences in nitrate content were found in different parts of Napa cabbages. In tender central leaves NO_3^- ion concentrations fall within the range of 500 to 700 mg/kg, in green parts of outer leaves, 800 to 900 mg/kg, and in whitened parts of outer leaves, 2000 to 2200 mg/kg. Black winter radish (with jackets, NO_3^- at 5000 mg/kg, without it, 3500 mg/kg) proved to be a top performer for nitrates among the sampled vegetables. Nitrates in potatoes increased pro rata to the sizes. Red paprika, Yalta onions, and kiwi contained virtually no nitrates at all. Quite significant quantities of nitrates (200 to 300 mg/kg) were detected in mushrooms, even after boiling.

The gathered data enabled us to draw the following conclusions:

1. Nitrate content in vegetables is subject to wide variance, which can be explained by growing conditions and inherent strain specifics.
2. Potable water from decentralized sources sometimes fails to meet the health standards and specifications.
3. The samples of black winter radishes, Napa cabbages, and squash (autumn harvest) displayed extremely high nitrate concentrations, 1000 to 5000 mg/kg.

KEY WORDS

Nitrates, vegetables, water, photometry, nitrate content

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