QUANTITATIVE METHOD FOR THE DETERMINATION OF NITRATE USING DIPHENYLAMINE

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https://doi.org/10.5281/zenodo.7332730

Annotation: *This work shows the qualitative determination of the content of nitrates in selected samples of vegetables and fruits. We clean the roots of vegetables, leaves and stalk of cabbage, fruits of fruits from impurities, then grind them into gruel and squeeze through gauze. Pour the squeezed juice into test tubes.*

Key words: *Chemical, measuring vessel, pipette, diphenylamine (crystalline), sulfuric acid (concentrated), test products, nitrates, metabolites, nitrites.*

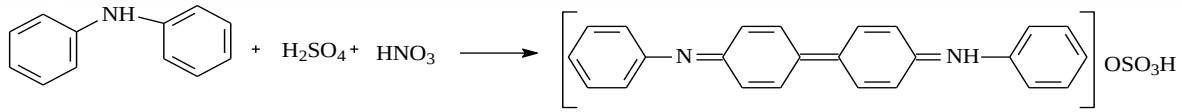
INTRODUCTION

Fresh fruits and vegetables, in addition to the health benefits, can be fraught with considerable danger. This is due to various chemicals that enter the plants along with fertilizers applied to the soil during their cultivation. The accumulation of nitrates depends on the biological characteristics of the plant, the form and method of fertilization, compliance with the timing of feeding and harvesting vegetables. For our body, nitrates in themselves are harmless. First of all, it is not nitrates that are dangerous, but their metabolites - nitrites, which are formed during storage, cooking and proper digestion. Nitrites block oxygen saturation of cells. Hemoglobin binds, the content of cholesterol and lactic acid increases [1-4].

METHOD AND RESULTS

A few crystals of diphenylamine are applied to the surface of a fresh cut (vegetable or fruit) and moistened with two drops of concentrated sulfuric acid. Then, by the color of the section, one can judge the amount of nitrites in the culture under study. Intense blue staining of the section indicates the presence of a large amount of nitrites, pink - to their low content and the absence of staining - to the absence of nitrates or their very low content.

You can show a chemical reaction.



Studies have shown that in all samples the content of nitrates does not exceed the permissible concentration, and the presence of a small amount is most likely due to the properties of the soil and the addition of nitrates to the finished meat products in order to improve its consumer properties and for longer storage [5-10] .

Sanitary supervision authorities have established strict standards for the content of toxic elements in food raw materials and finished food products. For most products, there are maximum allowable concentrations of toxic elements in staple foods.

CONCLUSION

A study of the literature on the topic of our study showed that the cause of excess nitrate nitrogen in vegetable and fruit crops is not only the illiterate use of nitrogen fertilizers when growing products. In fact, everything is much more complicated.

The content of nitrates in vegetables, in addition to the doses of fertilizers used, is affected by the timing and methods of application, cultivation conditions (temperature changes, humidity, illumination), the type of crop and the genetic characteristics of varieties. The reasons for the excess content of nitrates in the samples taken for the study are violations of agrotechnical and agrochemical methods of growing vegetable crops intended for sale to the population through retail outlets. The content of nitrate nitrogen, which does not exceed the MPC in samples that have been in water for 2-3 hours or more, as well as boiled ones, indicates that the content of nitrates in vegetables and fruits can be regulated and reduced.

Thorough washing of vegetables and fruits reduces the content of nitrates by 10%, and mechanical cleaning - by 15-20%. It is necessary to cut off those parts of vegetables in which their concentration is maximum. That is, in cabbage it is a stump and green upper leaves, in root crops it is a root, and in cucumbers and zucchini it is a place where the stalk is attached.

2. Greens (parsley, dill, lettuce, etc.) must be placed like a bouquet in water in direct sunlight. Under such conditions, nitrates in the leaves are completely processed within 2–3 hours and then are practically not detected. After that, greens can be safely eaten.

3. Before cooking, beets, zucchini, cabbage, pumpkin and other vegetables must be cut into small cubes and poured 2-3 times with warm water, keeping for 5-10

minutes. (Nitrates are highly soluble in water (especially warm) and are washed out of vegetables).

4. Boiling vegetables reduces nitrate content by 50-80%.

5. Fermentation, salting, canning and pickling help reduce nitrates by 60-70%.

6. Black and red currant berries, green tea, ascorbic acid (0.3–0.4 g per day) can neutralize nitrates that have entered the body.

7. You can not store and cook food in decorative porcelain or ceramic dishes (i.e., in dishes intended for decoration, but not for cooking), since glaze very often, especially yellow and red, contains lead and cadmium salts, which easily pass into food if such dishes are used for eating.

8. For the preparation and storage of food, use only utensils specially designed for food purposes. The same applies to beautiful plastic bags and plastic utensils. Only dry products can be stored in them even for a short time.

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