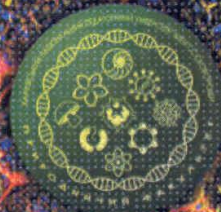


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# ПРИРОДНИЧА НАУКА І ОСВІТА: СУЧАСНИЙ СТАН І ПЕРСПЕКТИВИ РОЗВИТКУ

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## ТЕЗИ ДОПОВІДЕЙ

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**Aponchuk A.S., Kratenko R.I.**  
**ASCORBIC ACID CONTENTS IN APPLES OF DIFFERENT SORTS**

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**Aponchuk A.S., Kratenko R.I. ASCORBIC ACID CONTENTS IN APPLES OF DIFFERENT SORTS.** The present paper illustrates the possibility of ascorbic acid contents determination in nutrition products (apples, particularly) at school chemical laboratories. The method of determination is based on oxido-reductive titration in the presence of a specific indicator. Seven apple winter sorts displayed the adequate contents of ascorbic acid contents with the highest figure in the Semerenko sort.

**Key words:** *ascorbic acid, titration, apples of winter sorts.*

Ascorbic acid is an important nutrition factor for the human organism, which cannot be synthesized in our body tissues and must be supplied with food. It is a poly-functional vitamin; its biological activity is associated with participation in more than 30 organism processes. Ascorbic acid takes part in hydroxylation of proline and lysine during maturation of collagen molecules, reduction of sulfhydrylic groups in the structure of different enzymes, hydroxylation of aromatic amino acids in serotonin, dopamine, nor-epinephrine, and epinephrine synthesis, accelerates oxidation of NAD and NADP in mitochondrial and microsomal oxidations respectively. It is also essential for hydroxylation of steroids in biosynthesis of corticosteroids, reduction of folic acid in its co-enzyme forms, hydroxylation of vitamin D in calcitriol etc. Since vitamin C participates in many biological processes, its daily requirements are the highest amongst all vitamins. It is easily broken down by high temperatures, and, therefore, loses its biological functional activity. The best sources of this vitamin are fresh vegetables and fruit, amongst which apples are of the utmost importance, since they are generally rich in this vitamin, and are a popular nutritional product.

The present study objective was to investigate the possibility of determination of vitamin C contents in apples of different sorts at the conditions of an ordinary school chemical laboratory without application of high-priced reagents and equipment.

To determine vitamin C contents, we used a very popular method, i.e. of titration by 2, 6-diclorine-phenolindophenol. For that purpose, 10 g of apple flesh was rubbed in a mortar with a pestle in the presence of 20 ml of water. The obtained mixture was filtered through cotton-wool and titrated by 0.001 N solution of 2, 6-diclorine-phenolindophenol to the appearance of weakly pink color. The contents of the vitamin were calculated according to the formular:

$$X = A \cdot 0.088 \cdot C \cdot 100 / D \cdot M;$$

Where:

A – Volume of 2, 6-diclorine-phenolindophenol gone for titration;

C – Volume of apple flash extract;

D – Volume of extract taken for titration;

M – Apple flash mass.

Eight winter sorts of apples were taken to check the contents of vitamin C: Semerenko, Gold, Snow Calvin, Apple-Pear, Macintosh, Ida Ret, Jana Tan, and Fudges. The results are represented in table 1.

Table 1

**Ascorbic acid contents in apple flash of different winter sorts (per 100 g of tissue)**

Winter apple sort	Vitamin C contents
Semerenko	11.5±1.2
Gold	7.4±1.1
Snow Calvin	5.6±0.7
Apple-Pear	5.2±0.5
Macintosh	6.2±0.8
Ida Ret	4.4±0.5
Jana Tan	4.4±0.4
Fudges	3.4±0.3

As the results show, Semerenko apple sort has the highest contents of vitamin C, and can be recommended for nutrition purposes, as the most valuable. The whole method can be used at the conditions of school chemical laboratory.

**Bondarenko N.V., Kratenko R.I**  
**GLUTEN QUANTITY DETERMINATION IN FLOURS**  
**OF DIFFERENT SORTS**

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**Bondarenko N.V., Kratenko R.I GLUTEN QUANTITY DETERMINATION IN FLOURS OF DIFFERENT SORTS.** The present paper illustrates the possibility of gluten quantity determination in nutrition flour sorts at school chemical laboratories. The method of determination is based on washing the flour samples and weighing the gluten residue. As the results show, whole grain flour has the highest quantity of gluten and is the most valuable for nutrition purposes. The whole method can be recommended to perform at the conditions of school chemical laboratory.

**Key words:** *gluten, weighing, flour.*

Gluten is the protein component of seeds, nuts, cereals etc. Although gluten is quite poor in essential amino acids, it remains to be the main source of protein for the human organism, since the staple of the diet for the human body is, or should be, bread, porridge, cereals. Therefore, the higher amount of gluten is contained in flour, the higher is its value for the baking industry.

The present study objective was to investigate the possibility of determination of gluten quantity in flours of different sorts at the conditions of an ordinary school chemical laboratory without application of high-priced reagents and equipment.

The research used a method of Ukraine State Standard with some modifications. 25.0 g of wheat flour was weighed on the chemical scales, the flour was placed in a porcelain dish, and 13 ml of water was added. The water and flour were mixed with a spatula and rolled into a ball. The cup with the ball was closed with glass and left for 20 minutes at temperature of 16-20 ° C for gluten proteins to get swollen. Then, the ball of