МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

М А Т Е Р І А Л И

106-ї підсумкової науково-практичної конференції
з міжнародною участю
професорсько-викладацького колективу
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Матеріали підсумкової 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) – Чернівці: Медуніверситет, 2025. – 450 с. іл.

У збірнику представлені матеріали 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) зі стилістикою та орфографією у авторській редакції. Публікації присвячені актуальним проблемам фундаментальної, теоретичної та клінічної медицини.

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macromolecules and the failure of the antioxidant defense system can accelerate the development of various pathological processes underlying kidney diseases. One of these enzymes is catalase (CAT) [EC 1.11.1.6], which breaks down hydrogen peroxide formed by the action of aerobic dehydrogenases. The main function of catalase in the cell is the decomposition of hydrogen peroxide formed during the dismutation of the superoxide anion radical. CAT is present in the blood, bone marrow, mucous membrane linings, liver, and kidneys. In many tissues, including the kidneys, there are microbodies, and peroxisomes, rich in aerobic dehydrogenases and catalase. Therefore, the study of antioxidant defense enzyme activity, particularly catalase, which maintains the oxidant-antioxidant balance in the blood, is relevant.

The aim of the study. To determine the specific effects of salt loading in mercuric nephropathy on changes in catalase activity in the blood of rats.

Materials and Methods. The study was conducted on white non-linear sexually mature male rats weighing 180±10 g. The animals were kept in a vivarium with stable temperature and light conditions and divided into three groups. Intoxication with mercuric chloride was performed by subcutaneous injection of 0.1% mercuric chloride at a dose of 5 mg/kg body weight. After 72 hours of intoxication, a 3% salt load was administered; the salt load was performed 2 hours before euthanasia via a metal probe intragastrically. Two hours after loading, the animals were euthanized by decapitation under light ether anesthesia. Euthanasia was performed according to the requirements of the European Convention for the Protection of Experimental Animals (86/609 EEC). Blood was collected into tubes with heparin to obtain heparinized plasma. Catalase activity was determined in heparinized blood serum by the rate of hydrogen peroxide decomposition.

Results. Under the influence of abiotic factors such as toxic substances, water, or salt loading, free radicals are formed in the body. The increase in reactive oxygen species in the body leads to a shift in the oxidant-antioxidant balance in the blood of rats towards the activation of oxidative processes. As a result of the action of such strong oxidants, the body's antioxidant defense mechanism is triggered, supported by enzymatic activity, particularly catalase, which sequentially reduces H_2O_2 and organic hydroperoxides, preventing the development of lipid and protein peroxidation in biomembranes. In conditions of 3% salt loading against the background of mercuric nephropathy, an increase in catalase activity by 79% was noted in the blood of rats compared to the values in the group of animals subjected only to salt loading. However, under conditions of 3% salt loading, catalase activity did not change compared to the control.

Conclusions. The increase in reactive oxygen species in the body leads to a shift in the oxidant-antioxidant balance in the blood of rats towards the activation of oxidative processes. Changes in catalase activity were observed in the blood of rats under conditions of 3% salt loading against the background of mercuric intoxication. Under these same conditions, the catalase activity in the blood of rats subjected to salt loading did not change compared to the control.

Winkler I. A.

INFLUENCE OF NATURAL SUCROSE SUBSTITUENTS AND PECTIN ON THE VISCOSITY AND STABILITY OF WHEAT DOUGH

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Introduction. Sugar is a constituent component of various dough compositions and many other food items: pastry, beverages, and others. It is necessary to provide the sweetness of confectionery or regular dough, to maintain its nutritional value, and to keep the required value of some technological parameters such as dough viscosity and stability. The latter requirement is important in the context of dough storage and transportation, keeping organoleptic parameters of dough and pastry such as porosity, stability, friability, general shape, and appearance. Even though regular sugar is the cheapest and the most widely used sweetener, which is required for normal nutrition and functioning of the digestive system and other organs of humans, in many cases, it should be partially or completely substituted by other components because of dietary requirements, individual sucrose intolerance or other reasons.

When sucrose is replaced by other components, the total content of sugars required to keep the sweetness of an item may be greater or lower than that in the item made without sucrose substitutes. Any changes in the dough recipe lead to changes in its mechanical and sensorial properties. This issue must be addressed in order to maintain the normal technological process of the pastry or other items production and to make sure their customer qualities do not deteriorate.

The aim of the study. In this work, we analyze the dependence of dough viscosity and stability on the concentration of different sugars and possible approaches to compensate for the decrease of the dough viscosity that occurs when replacing sucrose with glucose and fructose.

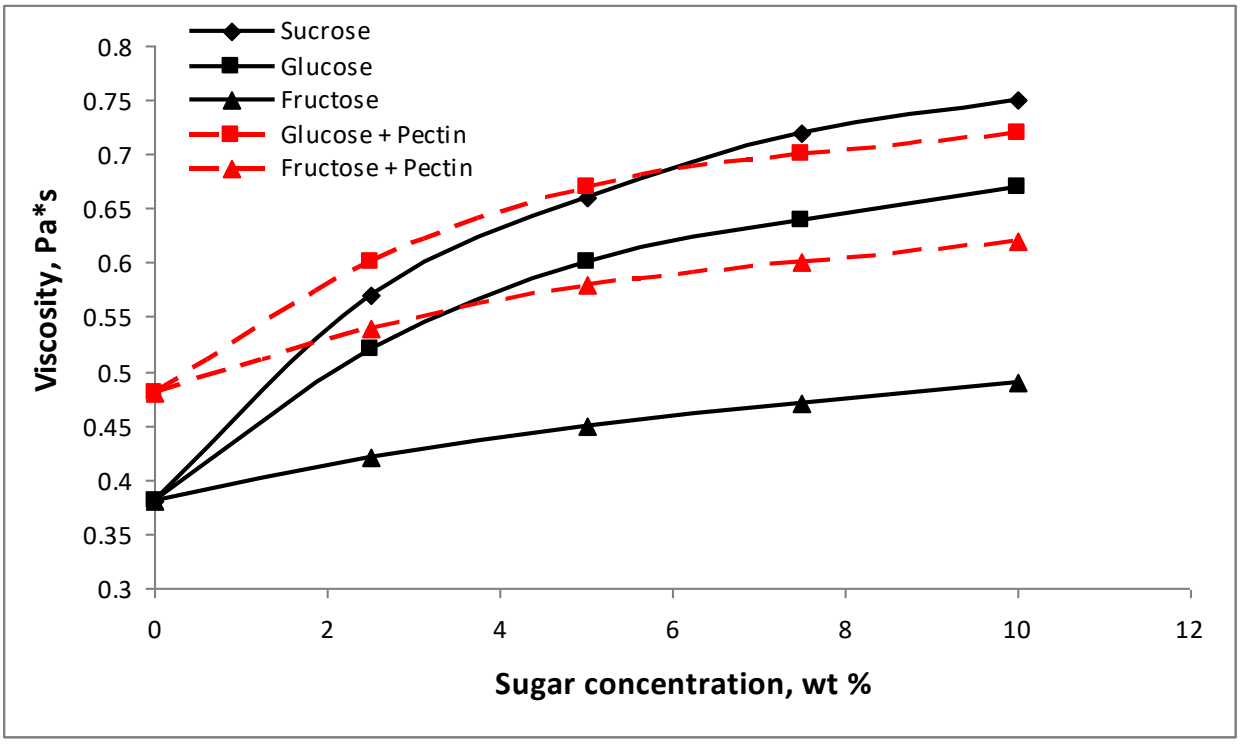
Materials and methods. Regular white wheat, sucrose (white sugar), glucose, fructose, and pectin of various brands were indiscriminately chosen and obtained from local grocery stores.

The effective viscosity of dough was measured using a rotational viscometer "Rheotest-2" by VEB "MLW" (Germany) with the set of cylinders "S and S_3" following the relevant instructions. The effective viscosity (η, Pa·s) was calculated as

$$\eta = \frac{z \times a}{D_r} \times 100,$$

where z – measuring cylinder's constant, a – shifting angle, deg, D_r – shifting velocity, s^{-1}.

Results. The dependence of a 20 % flour dough effective viscosity on the content of sugars: sucrose (♦), glucose (■), fructose (▲), glucose + 0.05 % of pectin (■), and fructose + 0.05 % of pectin (▲) is shown in the figure on the right.



Conclusions. Natural sugars affect the dough quality when added to its composition. Sucrose, glucose, and fructose increase the dough's viscosity, and the influence of sucrose is the most significant, followed by glucose and then fructose. When 0.05 % of pectin is added to the glucose and fructose dough compositions, their viscosity increases and approaches or even exceeds (for the contents of sugars below 5 %) those for the corresponding sucrose-containing compositions. These results are important in the context of keeping technological parameters and sensorial qualities of dough and pastry.