біологічною цінністю. Проведена дегустаційна оцінка показала, що кейк-попси з використанням безглютенових видів борошна, виготовлені за удосконаленою технологією характеризуються покращеними смаковими властивостями і рекомендовані до впровадження у виробництво. Підібрана композиція безглютенового борошна дозволяє віднести безглютенові кейк-попси до виробів лікувально-профілактичного призначення, а саме для людей хворих на целіакію.

**Література:**

1. Мацук, Ю. А., Є. О. Колпікова, and Н. В. Іщенко. Обґрунтування технології безглютенових кексів із додаванням насіння чіа. *Науковий вісник PUET: Technical Sciences* 1 (91) (2020).

2. Гірняк Л. І., Полотай Б. Я. Сучасні тенденції виробництва безглютенових макаронних виробів. *Вісник Львівського торговельно-економічного університету*. Серія «Технічні науки». 2019. No 22. С. 69–73.

3. Bezruchenko, Olha Mykolaivna. Technology of gluten-free cakes with buttermilk concentrate. *Publishing House "Baltija Publishing"* (2022).

4. Юдіна, Т. І., О. М. Безрученко, and В. О. Павлюченко. Обґрунтування складу борошняної сировини у технології безглютенових кексів. *Праці Таврійського державного агротехнологічного університету*. *Технічні науки* 19, т. 1 (2019): 179-187

## CURRENT TRENDS OF RESOURCE SAVING IN THE DAIRY INDUSTRY

Artur Mykhalevych, Uliana Kuzmyk, Viktoria Sapiga
*National University of Food Technologies,*
*Kyiv, Volodymyrska str. 68*

Resource savings at the enterprises of the dairy industry of Ukraine is a modern way to increase production efficiency and cost-effective

implementation, which not only saves raw materials, but also affects the growth of production with the same quantities of whole milk, fuel and auxiliary materials.

Milk and products of its processing are renewable raw materials, relatively expensive, and the process of their production - time-consuming [1]. Therefore, in terms of full economic calculation, it is necessary to direct funds and efforts to preserve raw milk, to a more complete and rational use of all its components in the processing process.

Measures to improve the quality and increase the amount of dairy resources should begin at the stage of livestock keeping, feeding, breeding and primary processing - filtration, cooling and transportation conditions [2].

In recent years, there have been some positive changes in the technology of dairy production, allowing more fully and efficient use of valuable components of milk. Modernization of technological equipment, application of modern packaging materials, fundamentally new technological methods - baromembrane, biological - are widely implemented. For the production of milk-containing products, skimmed milk, butter and whey are used, both in native form and in combination with raw materials of plant origin (vegetable, fruit, proteins of cereals and legumes, oils). All this allows to obtain from raw materials products of high nutritional and biological value and significantly reduce the cost of dairy resources.

Various measures can reduce the release of milk processing products into the environment (water, air). To reduce the unit cost of production is important to reduce the cost of heat and electricity, cold, water.

Complex mechanization and automation of technological processes from the acceptance of raw materials to packaging and storage of finished products reduce the cost per unit of output [3].

We consider it expedient to define the following as the basic principles of innovation policy in the sphere of functioning of milk processing enterprises:

- priority of innovative transformations of the industry in order to ensure food security of the country;
- increasing the level of intensity of innovative development;
- preservation, increase and activation of the potential of the branch;
- convergence of science, production and marketing of innovative products;
- state support and formation of an effective mechanism to support the development of dairy enterprises;
- commercial nature of innovative developments;
- intensification of international scientific and technological cooperation;
- environmental friendliness and safety of dairy products;
- continuous flow nature of waste-free production.

At the present stage of development of the dairy industry, ensuring a high level of resource savings is one of the main areas of stabilization and development of activities and competitiveness of enterprises. At the same time, the key elements of improving efficiency are sectoral measures aimed at finding and mobilizing unused renewable production resources.

The functioning of the management system of resource-saving activities at dairy enterprises is carried out on the basis of internal use documentation to ensure:

- rationing of indicators of production costs;
- integration of resource savings into a single enterprise management system;
- organization of accounting and control over the implementation of resource-saving measures at the enterprise;
- identification and fixation of problems related to resource savings;
- assessment of social, environmental and economic effectiveness of measures;
- creation of information and analytical database for the implementation of resource saving policy at the enterprise.

Implementation of the integrated management scheme involves the creation of separate or built-in organizational structures at the dairy enterprise, which will perform the functions of monitoring and adjusting the processes of resource saving in production [4].

Specialists included in such a structure must be highly qualified and thoroughly aware of all the changes that occur at the stages of supply of raw materials and materials, production, transportation, storage, sale. It is advisable to delegate additional functions for resource management to highly qualified employees of each structural unit.

Management of resource savings at domestic industrial enterprises is an important condition for the systematic growth of resource efficiency of production and ensuring the formation of a mechanism of self-reproduction, the components of which are:

- identification of enterprise problems that are related and can be solved through the implementation of resource-saving measures, the formation on this basis of an adequate policy of the enterprise on resource savings;
- planning of resource-saving activities of the enterprise, development of organizational and technical measures that ensure the implementation of planned indicators;
- technical and technological, regulatory, organizational and economic support for the implementation of planned tasks and the implementation of resource-saving measures;
- monitoring of resource savings at the enterprise, accounting and control, implementation of corrective and preventive effects on resource-saving processes;
- creation of an information database and reporting on the results of the implementation of resource-saving policies, management decisions on resource savings;

- periodic analysis of the results of resource-saving activities of the enterprise, assessment of the effectiveness of the management of resource-saving activities of the enterprise;
- improvement of the resource saving management system taking into account the influence of internal and external factors.

It can be concluded that the introduction of resource-saving technologies in dairy enterprises is a priority for the industry, the solution of which already has some positive changes. But on the way to achieve maximum efficiency of the enterprise there are significant problems that need to be adjusted. The main areas of resource saving in dairy enterprises are, first of all, the use of butter and whey and the introduction of new resource- and energy-saving technologies, which must be accompanied by the necessary financial and economic conditions for effective functioning of renewable natural resource complex.

**References:**

1. F.X. Milani, D. Nutter, G. Thoma, Invited review: Environmental impacts of dairy processing and products: A review, *Journal of Dairy Science*, Volume 94, Issue 9, 2011, Pages 4243-4254. https://doi.org/10.3168/jds.2010-3955.

2. J.H. Britt, R.A. Cushman, C.D. Dechow, H. Dobson, P. Humblot, M.F. Hutjens, G.A. Jones, P.S. Ruegg, I.M. Sheldon, J.S. Stevenson, Invited review: Learning from the future—A vision for dairy farms and cows in 2067, Journal of Dairy Science, Volume 101, Issue 5, 2018, Pages 3722-3741. https://doi.org/10.3168/jds.2017-14025.

3. I.C. Munro, L.A. Haighton, B.S. Lynch, S. Tafazoli. Technological challenges of addressing new and more complex migrating products from novel food packaging materials. Food Addit Contam Part A Chem Anal Control Expo Risk Assess, Volume 26, Issue 12, 2009, Pages 1534-1546. https://doi.org/10.1080/02652030902995277.

4. J. Denis-Robichaud, R.L.A. Cerri, A. Jones-Bitton, S.J. LeBlanc, Dairy producers' attitudes toward reproductive management and performance on Canadian dairy farms, Journal of Dairy Science, Volume 101, Issue 1, 2018, Pages 850-860.

## RESEARCH OF ELECTROOSMOTIC METHOD OF MOISTURE REMOVAL

Novik G. V., Honcharenko I. P., Prymenko V. H., Pantazi S.
*Oles Honchar Dnipro National University,*
*72 Gagarin Ave., Dnipro*

Studies of food products as objects to be dehydrated show that the basic laws of physical and biological processes occurring in them depend on the characteristics and nature of the connection of moisture with the solid frame of the material and water-soluble substances. Strong interaction of moisture with a rigid framework is absent at mechanical communication (capillary-bound moisture), therefore its removal is not caused by considerable expenses of energy and is carried out by various methods. Osmotically bound moisture in the product, as a kind of physical and chemical bond, is inside the cells and causes diffusion complicated by a semipermeable membrane. More energy is required to break this connection. The greatest amount of heat is needed to remove the monolayer of adsorbed water molecules.

Convective drying is more commonly used to remove mechanically bound moisture. Significant disadvantages of this method are the high energy consumption of the process, as well as the fact that the drying agent influencing the heat and mass transfer processes occurring in the product, first causes intensification of evaporation zone movement and the formation evaporation of moisture from the depth of the material. Combined convective-electroosmotic drying restrains the above negative changes [1].