PRACTICAL RESULTS REGARDING THE USE OF MUSHROOMS IN DAIRY PRODUCTS

**UDK 582.28:637.1**

***Abstract***

The purpose of the study is to present the practical results regarding the introduction of different types of mushrooms in the process of obtaining dairy products.

Edible mushrooms have a multitude of health benefits. They contain a series of nutrients, ensure an efficient digestion and they are very good for increasing immunity. Also, according to some laboratory studies, certain mushroom compounds have the ability to annihilate the development of tumor cells.

The proposed research focuses on the development of several acidic dairy products with addition of edible mushrooms such as Cantharellus cibarius, Boletus edulis, Pleurotus and Champignon. The developed assortments were compared from a sensorial and physico-chemical point of view with a regular product represented by a dairy assortment in order to note all the aspects that the edible mushrooms bring.

In order to obtain the new assortments, we started from the technology of obtaining acid dairy products with usual additions, and after the seeding process, before the product was packaged, the mushrooms were added in powder form.

Following the determinations made, the obtained results showed that the dairy products enrichment with mushrooms had a positive impact among consumers and the organoleptic analysis showed that consumers are willing to accept the new varieties developed.

From a physico-chemical point of view, in addition to the intake of nutrients and vitamins that mushrooms provide, the developed products performed very well in the laboratory tests, which means that the intake of mushrooms does not change the properties of the ordinary dairy products, but, on the contrary, they improve them.

***Keywords:*** *dairy products, edible mushrooms, nutrients, health benefits, organoleptic analysis*

THE IMPORTANCE OF WHEAT CONDITIONING IN THE PRODUCTION OF WHOLEMEAL FLOURS

**UDK 664.641.12:664.71**

***Abstract***

The grinding technique evolved along with the development of mankind and today it has become a real industry. The need to diversify flour assortments has raised the performance of the milling industry and, more than that, the products obtained are of superior quality due to the new machines and techniques for conditioning and grinding. By conditioning we mean the treatment of wheat with water or water and heat. It can be said that, among the technological operations of preparing wheat for mills, conditioning is the one that most influences the technological process of mills, the degree of extraction, the content of mineral substances of the flour, the separation of the germs and implicitly the baking properties of the flour. The essential parameters taken into account in this stage are the moisture content and the degree of hardness of the wheat grain. When determining the degree of extraction, the hectoliter weight has the major impact. Normally, an extraction of over 95% is sought when we talk about wholemeal flours. With the latest generation machines and their control with the help of new technology, 100% wholemeal wheat flours are obtained. The degree of extraction also influences the physico-chemical parameters of the flour and, of course, the ash content. Enzymatic activity of flour depends on the degree of extraction, and wholemeal flour is richer in enzymes than white flour. This difference is primarily due to the distribution of non-uniform enzymes in the wheat grain, starting from the core of the wheat grain to its periphery. Wholemeal flour contains significant amounts of bran and germs – the finer the bran, the darker the color of the flour – so it is important that the bran particles are larger and rarer for the flour obtained from the endosperm to express its characteristics in a meaningful way in the finished product.

***Keywords:*** Wholemeal Flour, Wheat conditioning, Quality

INTRODUCTION OF THE INDUCTIVELY COUPLED PLASMA (ICP-OES) METHOD FOR THE CHARACTERIZATION OF "GUBER" SREBRENICA MINERAL WATERS

**UDK 663.64:543.422.3**

***Abstract***

The mineral waters of "Guber" Srebrenica are highly mineralized waters with a significant content of soluble iron. They belong to iron-sulfate waters, which are rich in arsenic and therefore also called iron-arsenic waters with low pH values. Some of the "Guber" waters of Srebrenica were used for therapeutic purposes in the past. Spectrophotometric methods were used for their characterization. Today, instrumental methods are known which are faster and more efficient. This work focusses on using the Inductively Coupled Plasma - Optical Emission Spectrometry (ICP-OES) for the characterization of Guber Srebrenica mineral waters. Two standards were used to determine the elemental composition of these mineral waters, which differ in concentration and number of elements present. The results obtained by this method for soluble iron from different sources were compared with the spectrophotometric method of iron determination. The obtained results show that the lower iron concentrations in the samples obtained by the ICP method coincide with the results of the spectrophotometric method. However, with higher concentrations of iron (Očna voda), the deviations of the ICP method from the standard spectrophotometric method are greater and this may be the subject of further research. There are also discrepancies in the results between the standards for lead and arsenic, with higher values occurring in the samples where standards with a smaller number of present elements were used, which necessitates the use of standard methods.

***Keywords****:* mineral waters, spectrophotometric methods, ICP-OES methods, soluble *iron*

TRANSIENT THERMAL BEHAVIOUR OF A SUBSTRATE SUBJECTED TO THE ACTIVATION OF AN ELECTRONIC CHIP AND SURFACE COOLING

**UDK 536.24:621.3.045.15**

***Abstract***

Controlling the temperature of electronic components is a major interest for the electronics industry. Indeed, the lifetime of the components is directly dependent on the temperature levels reached in the electronic boards. Then, it is essential to predict the chip temperature evolution in order to maximize their lifespan. The electronic boards are more and more complex. They are multi-layers composed of different materials. The numerical resolution of the heat transfer equations in these systems requires very fine meshes and therefore very high computation times. It is possible to standardize the characteristics of these multilayer boards in order to treat them as a homogeneous material. The study presented in this work uses this approach and deals with the transient thermal behaviour of a substrate and its chip. The entire surface of the electronic board is cooled by convection. The developed model assumes that the surface convection coefficient is known, constant and uniform. The heat transfer by conduction in the substrate is based on an axisymmetric assumption on the longitudinal dimensions of the exchange surface (r, theta) and an assumption of semi-infinite medium in the transversal direction of the plate (thickness z). These assumptions are verified if, on the one hand, the activation times of the electronic chips are low enough and the dimensions of the chip is small compared to the electronic board. In these conditions, a fully analytical model is developed considering two successive integral transforms: a Laplace transform for the temporal variable, and a Hankel transform for the radial variable. An explicit expression of the temperature of the surface heated by the component is established, requiring very short computation times compared to numerical simulations. This model can be easily incorporated into a dimensioning code for electronic devices to predict their temperature. It can also be used as a direct model in an inverse procedure for identifying parameters on electronic boards.

***Keywords:*** analytical thermal computation, cooling of electronic systems, integral transforms.

THE INFLUENCE OF THE PROCESS PARAMETERS ON MORPHOLOGICAL CHARACTERISTICS OF FINE PRECIPITATED HYDRATE

**UDK 669.712**

***Abstract***

In this paper, the influence of process parameters on the morphological properties of fine precipitated hydrate was examined. The research was conducted with the aim of synthesizing fine precipitated aluminum hydroxide from the aluminate solution obtained by the Bayer process. Fine precipitated hydrates obtained in this way are mostly used in the non-metallurgical industry. The synthesized fine precipitated hydrate should comply with certain quality requirements such as granulometry (average particle diameter), purity, specific surface area, whiteness, etc. This paper shows the influence of certain technological parameters, namely the initial precipitation temperature, the amount and specific surface area of the seed, the influence of the NaOH/Al(OH)3 molar ratio on the characteristics of the synthesized fine precipitated hydrate in terms of the specific surface area, mean diameter and morphology of the obtained particles.

**Keywords:** analysis, hydrate, process, particle

EXPERIMENTAL STUDY OF THE PERFORMANCE OF OPEN-TYPE REFRIGERATED DISPLAY CABINET

**UDK 621.565.92**

***Abstract***

This paper presents experimental investigations of the efficiency of an open-type refrigerated display cabinet used to store food at temperatures between –1 and +7 °C. The purpose of the study was to increase the efficiency of the open-type cabinet by improving its design. The cabinet has five shelves for food products with lengths of 350-600 mm. The spacing between the base and the first shelf is 280 mm, and between the other shelves it is 250 mm. The air enters the cabinet from the return air grille (RAG) at the bottom of the front panel, fans blow air through the evaporator, and the cooled air travels through a tunnel to the top of the refrigerator. The perforated distributor at the top distributes the cooled air, and part of the air is blown through the perforated back panel and the other part passes through the air-off honeycomb (dimensions (W×H) are 120×20 mm) at the front top of the cabinet, thus forming an air curtain between the inside of the refrigerator and the ambient warm air to protect the chilled food products. The cooled air entering through the perforated back panel into the display area helps maintain the required food temperature. In this study, two versions of the refrigerated cabinet were analyzed. The first version is the standard refrigeration cabinet and the second version is the same cabinet but with a change in the angle of inclination of the honeycomb and a reduction in the depth of the shelves. Air and test product temperatures were measured with thermocouples, and electrical energy consumption was measured with the Carel MT300W1100 energy meter. The experimental results show that the infiltration ratio decreases from 38.7 to 27.7%, and the 24-hour electrical consumption decreases from 24.91 to 19.22 kWh in the case of the modified cabinet. The average air temperature in the return air grille (RAG) decreased from 7.5 to 6.52 °C with the same temperature settings. The average temperature of the M packages decreased by 0.2-2.2 °C depending on the position in the refrigerator.

***Keywords:*** air curtain, air temperature, energy consumption, heat transfer, honeycomb, open-type refrigerated display cabinet.